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General
Heading: BAKER MODEL "B" CASING CENTRALIZER

Unit No. A-12

Subject:
Field Practice of Centering Casing to Insure a Better Cement Job

BAKER OIL TOOLS, INC.
Main Office and Factory:
6000 So. Boyle Ave., Box 127, Vernon Station, Los Angeles, Calif.
Central Division Office and Factory:
6023 Navigation Blvd., Box 3048, Houston, Texas
Export Sales Office:
19 Rector Street, New York, N. Y.

Index: 250.1
Date: June 4, 1942
Page: 1 of 1 p.

The use of Casing Centralizers to provide a more uniform annulus between the casing and the wall of the hole at critical cementing points, is becoming standard practice in many territories. Field results have indicated that the uniform annulus thus provided for the slurry is an important factor in minimizing channeling and in securing a successful *first time* cement job.

Field results have also indicated that the Baker Model "B" Casing Centralizer is one of the most efficient types of centering units yet devised. The effectiveness of Baker Casing Centralizers and their ability to stand up under severe operating conditions was ably demonstrated in a recent job performed in the Mid-Continent area, the essential details of which are given below.

In this particular well, three Baker Model "B" Casing Centralizers (in addition to a Baker Cement Wash-Down Whirler Float Shoe and a Baker Cement Float Collar) were placed on a string of 5½" casing that was to be landed in a 9200′ hole. When the casing reached 7200′, the engine broke down and it was impossible to raise or lower the string for nine hours, during which time, however, circulation was maintained. When the engine was repaired, it was found the pipe was stuck and oil was circulated to aid in its release. Ten days were spent attempting to loosen the string before it was finally pulled out of the hole.

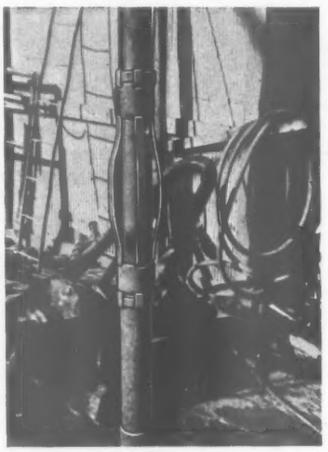


Fig. 1
Showing the excellent condition of one of the Baker Casing Centralizers on this job after being run in to 7200′ and then pulled from hole.

The three Baker Casing Centralizers were found to be in just as good a condition as when they were originally run in (see Fig. 1). Leaving these three original Baker Casing Centralizers on the pipe, a fourth Baker Centralizer, which had unintentionally been left off the string on the first run, was then added, and the casing re-run to bottom (9200′) without difficulty.

The reason why Baker Casing Centralizers can "take it" is because of their sturdy construction and unique operating principle . . . details of which are given below. (Also, see pages 248 and 249 of the 1942 Baker or Composite Catalog.)

OPERATING DETAILS ★ Baker Model "B" Casing Centralizer

The Baker Casing Centralizer, which in normal position is slightly larger than the casing or hole in which it is to run, is attached by merely slipping it on the casing, positioning it at the desired point, and plug welding the two Stop Rings. Due to the method of construction, when running casing equipped with a Baker Model "B" Casing Centralizer, there is no tendency of the Centralizer to revolve as it goes down the hole. Details of the operation of the Baker Model "B" Casing Centralizer are shown in the accompanying illustrations. Note that whether the casing is being lowered or raised, the Centralizer is always PULLED through the casing or past a restriction in the open hole . . . never PUSHED. This pulling action eliminates any possibility of the Centralizer Springs being distorted or damaged while landing the casing. One of the most important features is the fact that the Springs of the Baker Casing Centralizer always compress uniformly, tending to effectively center the casing in the hole regardless of the extent to which the Centralizer Springs are compressed.

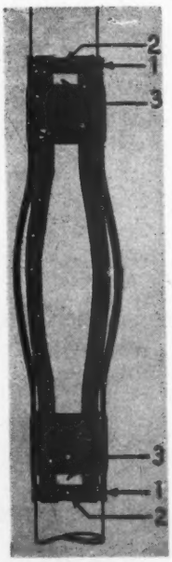


Fig. 2
Showing Baker Casing Centralizer Attached to Casing Before Running-In.

With ordinary types of Centralizers which have the Springs rigidly mounted on Rings, the hazard of damaging the Springs and impairing the centering efficiency of such units will be obvious to experienced operators.

(1) Stop Rings are positioned so that they engage the forged hooks on the ends of the Springs.
(2) The Stop Rings are plug-welded to the casing.
(3) Note space between Collars and Stop Rings to permit travel when Springs are compressed and elongated.
(4) When lowering the casing, the lower Stop Ring engages the hooks on the lower ends of the Springs, PULLING the Centralizer through the hole (or casing) rather than pushing it through.
(5) When running through open hole and a restriction is encountered, the Centralizer Springs UNIFORMLY COMPRESS and elongate in an upward direction, moving the upper Collar upwardly toward the upper Stop Ring. (This upward movement is made possible by the initial space provided between the upper Collar and the Stop Ring. The space is sufficient to allow the Springs to be compressed to their fullest extent against the casing without engagement of the upper Collar with the upper Stop Ring.)
(6) Note that during the downward travel of the casing the upper Stop Ring is never in contact with either Collar or the upper hooked ends of the Springs so that the Ring is unable to exert any pushing force whatsoever on the Springs that would tend to buckle or distort them.

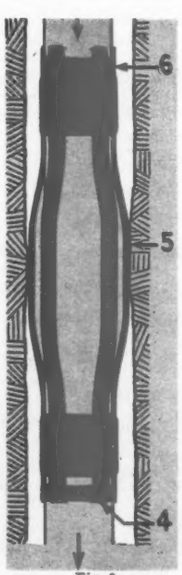
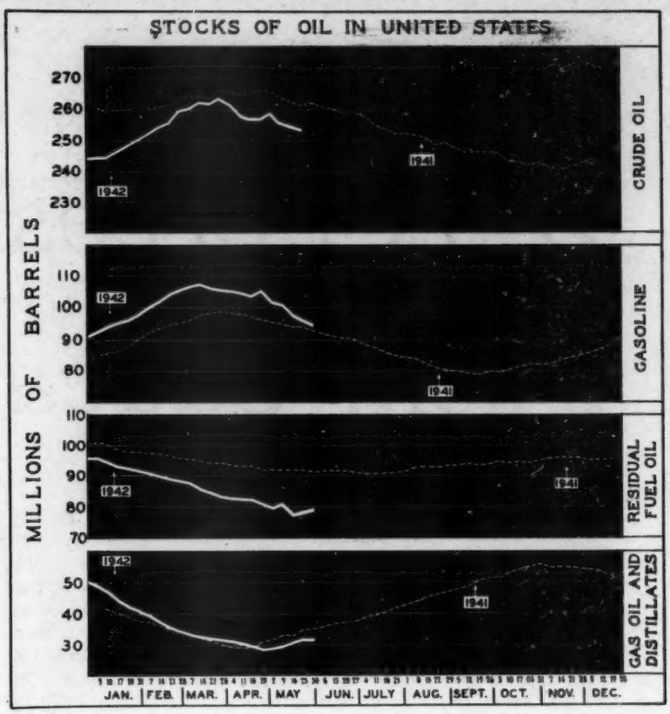


Fig. 3
Lowering Casing Equipped with a Baker Casing Centralizer. (When casing is raised, the action of the Centralizer is just the reverse as illustrated above, the unit being PULLED upward past the restriction by the contact of the upper Stop Ring with the hooked ends of the Springs.)

Trends

Reports Indicate Decline in Crude Demands Ended



MANY economists of the petroleum industry are in agreement that the steady decline in domestic crude-oil production under way since the first of the year has ended with indications that the leveling off in total requirements will continue indefinitely. In the absence of a final decision by the Government in regard to the national rationing of gasoline it is of course impossible to project accurately what the total demands will be for the third quarter and later in the year. However, all the available information points to the conclusion that, regardless of what happens to individual products, the worst is over in total petroleum demands for this year.

CRUDE PRODUCTION *3,903,800 bbl. daily average — up 283,475 bbl. One year ago 3,779,975 bbl.*

CRUDE STOCKS *253,423,000 bbl. as of May 23—down 779,000 bbl. One year ago 261,576,000 bbl.*

GASOLINE STOCKS *95,355,000 bbl. as of May 30—down 1,679,000 bbl. One year ago 93,156,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *79,628,000 bbl. as of May 30—up 186,000 bbl. One year ago 91,370,000 bbl.*

GAS OIL AND DISTILLATES *31,384,000 bbl. as of May 30—up 770,000 bbl. One year ago 35,373,000 bbl.*

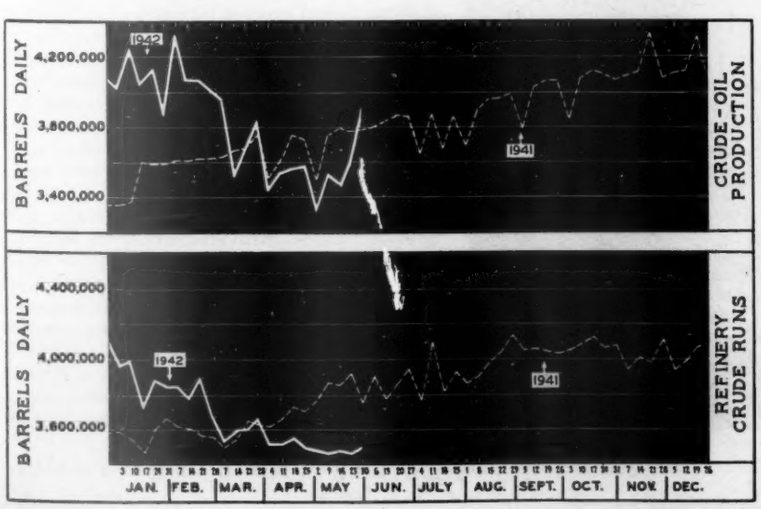
REFINERY RUNS *3,522,000 bbl. daily week ended May 30 — up 129,000 bbl. One year ago 3,759,000 bbl.*

Since December last year the total domestic supplies (crude oil, natural gasoline, and condensate) have decreased approximately 650,000 bbl. daily. That decline has been largely brought about by restrictions in tanker movements and does not reflect an actual decrease in demand of that amount. Since the first of the year stocks of all oils in the United States have decreased approximately 25,000,000 bbl. and about 80 per cent of that decline has materialized during the past 60 days. These data are proof that the projection of demand in recent weeks by governmental agencies was based largely on available transportation and there has been a discrepancy in those projections and the actual consumption, the difference being made up by substantial withdrawals from storage. The decrease in total oil stocks in April and May averaged more than 300,000 bbl. daily.

It is true that the rubber shortage will tend to reduce gasoline consumption regardless of whether or not rationing now effective in the East and the Pacific Northwest is extended to include the rest of the country. But statisticians are pointing out that so far as total petroleum supplies are concerned this decline will not mean a comparable reduction in domestic crude-oil production assuming that the policy of reducing stocks must end and supply and demand of all oils be kept in balance. Demands for most petroleum products other than gasoline so far this year have increased substantially and there are no plans now to ration any of those products on a basis comparable to that which has been made effective in gasoline. Later in the year, the production of 100-octane gasoline and other war products will increase. Those in a position to know predict larger foreign shipments the last half of this year. When these data are balanced against each other they point to increased production over the next few months. It is significant in this connection that OPC's recommendations for liquid petroleum production in June provided for an increase of 108,600 bbl. daily over May.

DAILY AVERAGE PRODUCTION FOR WEEK

	May 30, 1942	May OPC recommended production	May 23, 1942
Arkansas	72,750	74,000	70,865
California	587,750	673,800	632,250
Colorado	7,600	7,900	7,675
Eastern fields	120,100	123,300	119,200
Illinois	287,290	329,200	295,745
Kansas	256,500	259,300	256,250
Louisiana	294,700	298,600	305,225
North Louisiana	*86,550*	.....	*85,925*
Louisiana Gulf Coast	*208,150*	.....	*219,300*
Michigan	64,400	60,500	62,100
Mississippi	82,000	48,100	85,580
Montana	21,720	25,200	21,570
Nebraska	4,000	4,500	4,075
New Mexico	74,370	73,300	74,460
Oklahoma	383,250	438,500	386,250
Texas	1,549,800	960,000	1,203,300
East Texas	*495,000*	.....	*370,600*
West Texas	*210,000*	.....	*156,700*
North Central Texas	*155,950*	.....	*145,600*
East Central Texas	*100,050*	.....	*87,100*
Texas Panhandle	*98,000*	.....	*88,000*
Texas Gulf Coast	*426,050*	.....	*303,650*
Southwest Texas	*64,750*	.....	*51,650*
Wyoming	97,570	98,300	95,780
Total United States	3,903,800	3,474,500	3,620,325
Total production, Jan. 1-May 30, 1942	596,806,520 bbl.		
Same period last year	545,458,975 bbl.		



Axis Forces Are Still Far From Caucasian Fields

By J. P. O'DONNELL

NEW YORK.—Military critics are unanimous in the belief that the oil of the Caucasus is a major goal of the year-old Axis campaign in southern Russia and many believe that acquisition of that oil is essential to an Axis victory. If these opinions are sound it is apparent from a study of the present positions of the Nazi armies in relation to the Caucasian oil fields that Germany faces a task far more difficult than any she performed so far in 33 months of war.

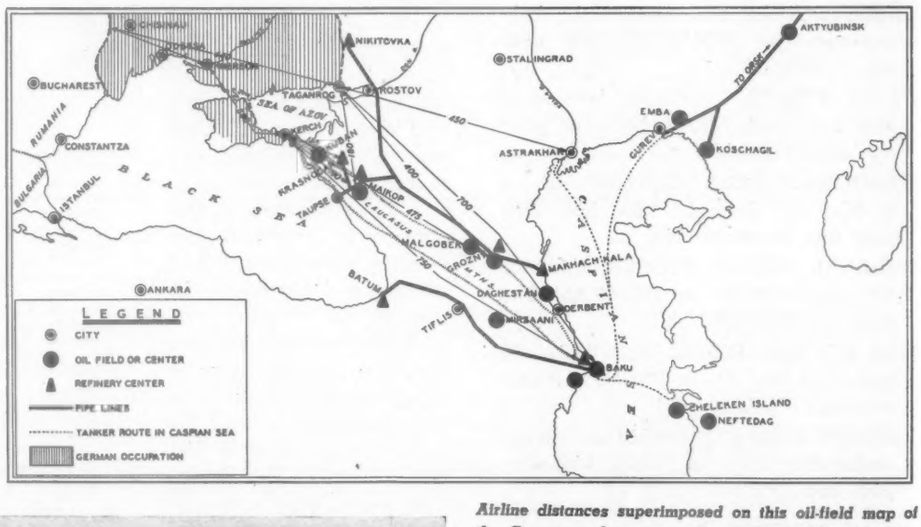
Most advanced of the German armies in the southern Ukraine are those in the Taganrog-Mauripol area, northeast of the Sea of Azov, while those in the Crimea have retaken the Kerch Peninsula from the defending Soviets. In moving as far as Taganrog from Bessarabia the Germans covered an airline distance of approximately 440 miles. An advance originating from the same point and terminating at Kerch covered a direct land route of about 360 miles. These distances compare with those remaining between Taganrog or Kerch and the principal Caucasian fields as follows:

To:	Airline miles from Taganrog	Airline miles from Kerch
Maikop	180	125
Grozny	400	475
Baku	700	750

Not only do great distances still remain between the Axis armies and the Caucasian fields, but there is also the formidable barrier of the Caucasus Mountains protecting Baku, the largest Soviet oil area. Since it required more than 5 months for a fresh German army abetted by the element of surprise to move 450 miles across the flat plains of the Ukraine, it is not reasonable to assume that the same army, probably less prepared, with much longer supply lines and facing a more experienced foe, will make better progress around and through the rugged Caucasus. Even if the Germans do duplicate last year's advance of more than 400 miles, winter will again have come to the aid of the Russians before the Baku field is reached.

The Germans are closest to the Maikop fields of Kuban, only 190 miles across the Straits of Kerch and the Taman Peninsula. Production of these fields normally averages about 40,000 bbl. per day, but in view of the loss of the Black Sea markets it is now possibly less. Maikop crude supplies the Krasnodar refinery through an 8-in. line and oil may also be delivered through the Grozny-to-Taupse branch to the Black Sea. The Krasnodar refinery, approximately 125 miles from Kerch, had a reported prewar capacity of 22,000 bbl. Krasnodar and Maikop probably would be the first oil objectives of an invasion of the Caucasus but they would be valueless to the Germans unless obtained intact, a remote possibility in view of the Soviet scorched-earth policy.

German armies would have to duplicate or exceed their 1941 successes to seize the Malgobek-Grozny-Daghestan fields since Grozny, their approximate center, is 400 air miles from Taganrog and 475 from Kerch. Production in these scattered fields, which extend half way across the isthmus, is estimated at slightly less than that of Maikop. Grozny is connected with Donets basin, Taupse on the Black Sea and Machkach Kala or Mach Kala on the Caspian by pipe lines. Since these fields, like Maikop, are not vital to the Russian war effort, it is certain that they too would be destroyed and the pipe lines rendered useless before they were allowed to fall into German hands.



Airline distances superimposed on this oil-field map of the Caucasus shows enormity of the problem blocking Nazi ambitions to capture or knockout this base of Soviet supply. A typical field scene in the Daghestan area is pictured

Sóvfoto

Either a total collapse of Russian resistance or a remarkable military feat seem necessary for the Nazis to acquire the Baku and other Azerbaidjan oil fields south of the Caucasus. These mountains extend from Taman Peninsula to the Apsheron Peninsula on which the Baku field lies. The range varies from 30 to 140 miles wide and has many peaks above 15,000 ft. There are only three passes between north and south Caucasus, the Darial Pass through which the so-called Georgian military road passes from Vladikavkaz to Tiflis, the Mamison Pass and the Derbent Gate on the shores of the Caspian. The Darial Pass parallels the Terek River and at one point goes through an 8-mile gorge with 6,000-ft. walls. The Derbent Gate is also vary narrow and the single railroad is built just above the surf. At the western extreme 2,000 to 3,000-ft. cliffs overhang the Black Sea.

Conquest of Baku would be necessary for the

Germans to gain any real advantage for themselves or do any serious harm to the Russians. Daily average production of the Baku fields approximates 470,000 bbl. and it accounts for more than 70 per cent of all Soviet production. Here also are Russia's principal refineries and north of the Apsheron Peninsula are her main hydrocarbon chemical industries where a part of her synthetic rubber is manufactured. Baku oil normally constitutes two-thirds of Russia's exports from her main oil port, Batum, just north of Turkey in western Caucasia. The oil is transported to Batum through two parallel lines about 500 miles long. Baku is also the main source of supply for European Russia. The oil is taken to the north Caspian port of Astrakan and then barged up the Volga to Central Russia. Baku, with a population of 800,000, has its own oil-equipment manufacturing industries and is to a large extent independent of the rest of the country.

Loss Would Not Mean Defeat

Even if Russia were deprived of the entire Caucasus which would result if a 450-mile German drive from Taganrog to Astrakan were successful, it would not necessarily mean her defeat for lack of oil. Northeast of Astrakan on the Caspian are the Emba fields which produce upward of 12,000 bbl. per day. These fields supply the refinery at Orsk through a 435-mile pipe line and that refinery in turn supplies much of the requirements of the southern Ural and western Siberian area.

More important and much more remote are the scattered Ural-Volga fields. The first of these was discovered in Chusov Gorodski in 1929, 310 miles east of the Volga in the western Urals. In 1932 oil was discovered at Ishimbayev and later at Krasnokamsk, Tuimaz, Bugurouslam and in 1937 near Sizran on the Volga and in the Chelyabinsk area east of the Urals. Production of the Ural-Volga fields stretching from Izhma on the north to Sizran on the south and from Ivanova on the west to Ishimbayev on the east is estimated at 75,000 bbl. per day with a potential far in excess of that amount. Ten refineries east of Moscow, most of them built within the last 10 years to process oil from the new fields and therefore comparatively new, provide capacity that should be ample to meet military requirements even if Germany should succeed in conquering the Caucasus.

●

OPA Permits $1.30 Contract To Stand on East Texas Crude

WASHINGTON, D. C.—A maximum price of $1.30 per barrel for East Texas crude sold by the Houston Oil Co. of Texas at its No. 11 tank, Peterson farm, Isaac Ruddle Survey, Rusk County, Texas, was permitted last week by the Office of Price Administration in an amendment to its petroleum and petroleum products price schedule.

The amendment (No. 16 to Revised Price Schedule 88), is effective February 2, 1942.

All of this production is bought under contract by Shell Oil Co., Inc.

On October 8 last, the companies involved renewed a contract made October 30, 1940, providing for the Houston company to sell its entire output at a gathering point in the East Texas field at a price which was to be the sum of the posted price for the pool plus 5 cents per barrel. Provisions of Revised Price Schedule 88 made necessary a reduction in the agreed-on price of 2.5 cents per barrel.

Both petitioners declared the price established under the schedule was subnormal when competitive conditions are considered and asked OPA to restore the contract price.

Floating power is no catch phrase on the Louisiana Gulf Coast. Fuel tanks, drilling engines, pumps, drilling machinery and other facilities are installed on barges like these shown here for development of submerged fields

This Week...

TRANSPORTATION.—Decision of the War Production Board on steel for the 24-in. line from Texas to the East Coast, or a portion of the project, expected within few days. Time taken to study details may be good omen . . . House rejects special consideration for Florida pipe-line and barge-canal bill, may be brought up in regular order. Eight-inch line may be built by industry, without congressional authority . . . Tank-car shipments to East Coast set another record, averaging above 706,000 bbl. daily in week ended May 23 . . . Government officials seek diversion of 30 per cent of tank cars remaining in Middle West service, but pressure has not been applied . . . Industry wants partial reestablishment of coastwise tanker service, with adequate protection, to halt liquidation of stocks, build up inventory . . .

PRODUCTION.—Texas commission sets first-half-of-June allowable 219,578 bbl. daily above OPC recommendation . . . Nation's output rises 283,475 bbl. daily last week . . . Most significant increase was 346,500 bbl. in Texas . . . Oil showings in the Ordovician lime in Virginia and the Edwards Plateau may presage considerable activity in these virgin territories . . . Completions to end of May totaled 8,209, exclusive of input wells, indicating industry will not materially exceed goal of 16,000 for year, considering wells started prior to M-68 effective date, made January and February figures abnormally high . . .

REFINING.—About 30 per cent of refining facilities for 800,000 tons of the synthetic-rubber program are under construction . . . Increases in over-all refinery costs of 8 to 15 cents per barrel are foreseen by Mid-Continent plant operators in accepting recommendations for a 20 per cent reduction in gasoline yields . . . Mid-Continent refiners raise gasoline prices 0.125 cent per gallon . . . Use of ethyl alcohol as base stock for part of the butadiene-rubber program does not necessarily exclude petroleum refiners. They can make it as well as distillers, have been doing it for some time by converting ethylene . . .

RATIONING.—More drastic restrictions in eastern states foreseen, unless coastwise transportation is resumed . . . Deliveries fall short of bare essential requirements . . . Restrictions in Middle West, other areas of plentiful supplies, delayed, by protests from public voiced through political representatives. May be averted permanently where supplies are abundant . . . White House attentive to squawks from interior . . . Resort centers in eastern states continue agitation for more equal spread of supplies . . . Formal order entered removing more severe curb on distributors in Washington and Oregon where proposed consumer rationing was abandoned a week ago. Regulations holding distributors to 66 2/3 per cent of normal gallonage continued . . .

PRIORITIES.—Oil industry urged to minimize requests for critical materials. Advised to specify substitutes at all possible points in preference-rating applications, to speed up process, reduce number of rejections . . . Builders of plants for production of war materials still have difficulties in obtaining certain steels and instruments, on schedule . . .

SYNTHETIC RUBBER.—General agreement that nonessential civilian requirements will receive no relief until 1944, possibly early 1945 . . . Farm bloc forces inclusion of 200,000-ton project from alcohol. Claims of cheaper butadiene from crops than petroleum discounted in government quarters that count . . . PIWC submits plan for supplying tires—new ones and recapping material chiefly from reclaimed rubber—to maintain all mechanically usable passenger automobiles in service . . .

Political and Industrial Protests Interrupt Rationing Program

By HENRY D. RALPH

WASHINGTON, D. C.—Tremendous political pressure is being built up against nation-wide gasoline rationing.

As a result, it appears now that rationing will not be instituted as early as July 1, or possibly not at all, whereas 10 days ago it seemed likely that strict rationing would be in effect throughout the country early this summer.

Admittedly the only reason for rationing gasoline outside of the East Coast and other sections with curtailed supplies due to transportation deficiencies is to force a conservation of tires now on the nation's passenger cars and trucks. The theory is that limiting the purchase of gasoline is the most effective way of reducing tire usage to a minimum.

But members of Congress and other spokesmen for areas where there is no oil shortage are not convinced that such a drastic measure is necessary, and they are protesting publicly and vigorously. The general attitude is that the public will cooperate voluntarily and patriotically in eliminating unnecessary driving if convinced that tires must be saved, and that a properly directed campaign will accomplish as much as forced rationing.

Several Congressional Investigations

The protests rolling into Washington have resulted in half a dozen investigations by congressional committees, most of which have gone over pretty much the same ground. Government officials have been called on to say just how serious the rubber shortage is, how fast the synthetic-rubber program can be pushed, how much can be expected from reclaimed scrap rubber, whether or not rubberless tires can be expected, how existing supplies of rubber can be used more efficiently, and, as regards the East Coast, how more gasoline can be transported. As is usual in such circumstances, there is much confusion as to the actual facts, and many statements have been made based on half-truths and inventors' hopes which may or may not prove technically feasible.

President Roosevelt himself added to the confusion last week when he told his press conference that there is nothing in the situation to cause undue excitement, adding that he had heard of progress on two or three types of tires which contain no rubber but which are satisfactory at speeds of 30 or 35 miles per hour.

At that very moment officials of the War Production Board, Office of Defense Transportation, and Office of Price Administration were working on plans to cut down the use of tires by gasoline rationing, by limitations on travel, commercial deliveries, and other vehicle use, and by a campaign to convince the public that no new tires could be expected for 2 or 3 years.

The president's offhand remark appeared to make them look silly. It certainly added tremendous political support to opponents of gasoline rationing which include large portions of the oil industry, the resort areas, and many other segments of the population. As far as can be learned these agencies are continuing with their plans for nation-wide gasoline rationing to be invoked if, as and when it becomes the policy to institute it. But the determination of such a policy undoubtedly has been deferred and quite probably will have to come from the White House.

Confusing statements by officials concerned with rubber conservation have also supplied fuel for the political flames. Weeks ago the public was warned that it should not expect new tires for 2 or 3 years, and as a result there was a considerable voluntary reduction in motoring, though not as much as officials consider essential. Then the word began to be passed around that the reason for saving tires is that the Government intends to requisition private cars and tires for use by workers in war plants.

This statement, according to many critical congressmen, had the effect of undoing all the pleas for voluntary curtailment of driving. They argued that car owners would save their own tires, but if they knew that the Government intended to requisition them soon they would use them to the maximum while the opportunity lasts. Apparently the talk of requisitioning is based on fears in some quarters of what the transportation situation may be in a year or two, and there are no serious plans for confiscating private cars or tires in the near future.

The rationing situation today, therefore, is surrounded with much confusion. A permanent system of gasoline rationing must go into effect in the East Coast area July 1 when the present temporary cards expire, and so OPA is completing details for this system. Presumably the identical system would be used throughout the country, though the administrative work alone would prevent putting it into effect outside of the present rationing area at so early a date. There appears to be little doubt that the rubber situation is, as officials describe it, desperately critical, and that existing tires must be conserved as much as possible, but how to achieve this conservation of tires is still a subject of discussion within the administration.

Protests in Congress reached the point of demands for repeal of legislation delegating to "bureaucrats" the power to issue such orders as gas rationing and tire requisitioning. Also under severe attack is the ODT order curtailing truck movements, particularly the section requiring a truck to carry 100 per cent load in one direction and at least 75 per cent load in the other on every trip. So vigorous were protests last week that ODT postponed effective date of its truck order 30 days until July 1. Several members of Congress demanded that a public hearing be held before a decision is made to ration gasoline in areas where there is no oil shortage. Many prominent administration members of the Congress joined in these protests, including Speaker Rayburn.

Thus the question of nation-wide gasoline rationing appears to depend, at the moment, on whether the WPB and other war agencies concerned can go ahead with their plans in spite of the political pressure against it, or whether they will decide to continue for the present with voluntary appeals to motorists and commercial vehicle operators to curtail tire use.

Eastern Oil Deliveries Are Short of Essential Demand

NEW YORK.—Even though tank-car loadings for delivery to District 1 have reached a peak of almost 700,000 bbl. per day, nontanker deliveries to the East Coast's so-called "shortage area" are still inadequate to meet even the barest essential demands. It is evident, therefore, that either some tanker transportation must be resumed or that present restrictions on consumption be continued and possibly be made more severe.

It has been estimated that available supplies for District 1, excluding emergency tank-car shipments and all tanker deliveries but including normal rail deliveries of some 20,000 bbl. per day, now total 350,000 bbl. per day. This includes pipe line and barge transportation and Pennsylvania Grade crude-oil production. If tank-car deliveries average 700,000 bbl. per day during June, this would indicate that a total of 1,050,000 bbl. of crude oil and refined products would be available daily this month.

This total would still be short of supplying even basic essential requirements which are estimated at 1,075,000 bbl. per day in June. These demands will grow as use of heating oil rises with the arrival of cold weather next winter. East Coast requirements are expected to reach 1,130,000 bbl. per day in the third quarter and 1,375,000 bbl. per day in the fourth quarter. For the last three-quarters of the year as a whole, basic essential requirements are estimated at 1,265,000 bbl.

The estimate of 1,265,000 bbl. daily essential demand assumes a 60 per cent reduction in the average use of gasoline per passenger car, a reduction of 20 per cent in the consumption of domestic fuel oil per burner and a 10 per cent conversion to coal. Since even this basic figure is not being met by tank-car inland-water way and pipe-line shipments, it is obvious that tanker transportation or more severe restrictions are necessary.

Even if the essential demand is supplied, severe restrictions on normal consumption would be necessary. It is estimated that under normal con-

ditions, consumption in District 1 would average about 1,800,000 bbl. per day this year. This is more than 40 per cent above the barest minimum requirements which are not yet being met by safe means of transportation and a goal wholly unattainable without resort to tankers.

It has been estimated that tank-car deliveries may still be increased to 800,000 bbl. per day. In view of the remarkable increase so far this does not seem beyond reach. However tank-car shipments of oil at the rate of 700,000 bbl. per day are equivalent to approximately 150,000,000 ton miles of freight per day and this is a heavy burden especially in the more congested areas even though railroads, in many instances, are giving preference to oil shipments. It is questionable if shipments of this volume can be maintained during the normal increase in all rail traffic later in the year and during the winter when weather conditions hamper rail service.

No other form of repair is expected to contribute substantially to solution of the problem for some months. Increased shipment by inland waterways is dependent on construction of new barges which will require time and material. Relocation of pipe lines is just beginning and it will be several months before the first is completed. Even when a greater number of barges is available and when pipe lines are relocated, their combined effect will still be insufficient to meet nonessential as well as essential requirements without help of tanker transportation.

War Board to Decide Soon on Latest Pipe-Line Steel Plea

WASHINGTON, D. C.—The War Production Board may act within a few days on the request of the Office of Petroleum Coordinator for allocation of steel to construct a 24-in. pipe line from Texas to the Atlantic Coast, and that decision is of the utmost importance to the entire oil industry east of the Rockies as well as to consumers of petroleum products in much of that area.

Without such a pipe line there appears to be no way to transport the surplus crude and refined products of the Mid-Continent area to the consuming areas of the eastern states. Chairman Donald M. Nelson of the WPB has said publicly that steel for the line cannot be granted without upsetting the schedule for production of ships, planes and tanks, which is taken to mean that the allocation will not be made unless urgently endorsed by the other members of the board and by the White House. He has, however, appointed a committee within WPB to study the request and the supporting data submitted by OPC, and Coordinator Ickes expects to appear in person to support the project.

The East Coast supply situation is pretty well known to leaders in the oil industry, as figures are available on all but two factors—existing stocks in the East and coastwise shipments by tankers. For military reasons these figures are not published, but so many high government officials have stated that plans must be made to supply the East without reliance on tankers that it is evident that relatively small quantities of tanker shipments are counted on. And public information shows that with neither tankers nor new pipe lines there is no way of supplying demands in the eastern area.

Last summer, tankers were delivering around 1,400,000 bbl. per day. Currently tank cars are bringing in by rail around 700,000 bbl. per day, and deliveries by pipe line and barge are around 285,000 bbl. per day. This means that unless consumption is cut to meet the supply and no tanker deliveries are made, stocks are being depleted rapidly.

Deliveries into District 1 vary somewhat from week to week, particularly tank-car deliveries. An estimate of other deliveries for May, in barrels per day, is as follows: production in District 1, 75,000; crude pipe-line movements, 80,000; products pipe-line movements, 45,000; via Great Lakes, 35,000; Ohio River barges, 25,000; barge deliveries to West Coast of Florida, 26,000; via Southeastern Pipe Line, 30,000. This makes a total of 316,000 bbl. per day, but tank cars must be used to complete the movement of much of this oil. In addition, tank cars are bringing from 600,000 to 700,000 bbl. per day into District 1 from other districts.

Estimates are that 800,000 bbl. per day is the maximum rate of tank-car deliveries which can be attained. There are 145,000 tank cars in the United States, of which 33,000 are considered absolutely essential for shipping chemicals, foodstuffs, and other products, or must be used by the railroads for water and fuel. Of these cars, around 80,000 are normally used in distributing petroleum products in the Middle West and Southwest. About 50,000 tank cars have already been put into the eastern service, and the maximum possible is considered to be 60,000. When the movement first started it was estimated that one tank car could deliver 17.75 bbl. per day, but now the average has dropped to around 14.25 bbl. per day because smaller cars have been pressed into service and longer hauls must be made.

Railroads Have Limit

Even if more tank cars were available it is believed that the railroads would not be able to deliver more than 800,000 bbl. per day because of the heavy demands for hauling other freight. This factor is expected to reduce oil shipments by fall or winter, and in addition some of the tank cars may have to be returned to the Midwest and Southwest as tank trucks now in service there are taken off the road for lack of tires. To move 600,000 bbl. of oil per day into District 1, it is estimated, the railroads must use 800 locomotives, and this movement is equal to 8 per cent of the average ton mileage of all railroads in the United States.

The only other means of delivery are by pipe line and barge. Through Directives 49 and 50, the OPC is planning to get the maximum use of these facilities, though tank cars will be needed for many of the projects. When all pipe-line relaying is completed and the other projects and plans are in operation it is estimated these means will increase deliveries into the Eastern district by some 200,000 bbl. per day. It will probably take until the end of the year to reach this figure, however.

The only other means of delivery, if tankers must be considered out of the picture, is the proposed 24-in. pipe line from the East Texas field to the Philadelphia-New York refining area. It would require approximately 340,000 tons of steel and take nearly a year to complete, but could deliver around 250,000 bbl. per day. Within 6 months, however, the western end of this line could be in operation pumping oil to railroad terminals much nearer the East, thus shortening tank-car hauls and relieving the situation to a considerable extent.

Unless there is some relief for the eastern transportation situation, either from tankers or a new pipe line, it is apparent that deliveries of petroleum products will be less than the essential demand, and that the most drastic rationing will be required to cope with the condition. Consumers in the Middle West and Northwest may also suffer because of a shortage of tank cars to serve markets in those regions normally supplied by that method. Even more serious will be the effect on Mid-Continent and Gulf Coast producers and refiners who are without means of reaching their markets.

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Synthetic Rubber Can Be Made From Refinery Ethyl Alcohol

CHICAGO, Ill.—Today, when ethyl alcohol is proposed as a source of butadiene, needed in vast quantities for the production of synthetic rubber, it is interesting to note that Dr. Vladimir N. Ipatieff, director of chemical research, Universal Oil Products Co., and a professor of chemistry at Northwestern University, was the first to establish the formation of butadiene from ethyl alcohol in a single-stage operation.

However, Dr. Ipatieff carried this work, which was done in Russia in 1903, only as far as the laboratory stage, being interested primarily in other objectives at the time. Later workers have made further important discoveries in this field and have developed efficient processes to produce this vital chemical economically from alcohol. These processes are now being offered to American refiners.

Acknowledgment of Dr. Ipatieff's early achievement is made by Dr. S. V. Lebedev in his article, "Preparation of Butadiene Directly From Alcohol," published in 1933. Dr. Lebedev was one of the outstanding Russian chemists and is conceded to have played the largest part in developing commercial rubber from alcohol for his country. He was decorated by the Soviet Government for his achievements.

Dr. Lebedev's work has been translated as a part of the current issue of Universal Oil Co. Survey of Foreign Petroleum Literature, by J. G. Tolpin. The U.O.P. Survey is now engaged in translating completely the Russian literature covering the extraction of butadiene from petroleum gases, as well as its production from alcohol. It is pointed out by leading chemists that petroleum gases are an economical source of ethyl alcohol.

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Minimum Use of Scarce Materials Urged by OPC

WASHINGTON, D. C.—The oil industry was urged Monday by the Office of Petroleum Coordinator to redouble its efforts to minimize the use of scarce materials.

OPC called the industry's attention to the fact that many applications for priority ratings are now being denied because the requests include certain critical materials for which substitutes could be found.

In every case where a substitute noncritical or less critical material can be used, the more critical material will be denied.

A list of critical materials and the action usually taken by the WPB on applications for ratings on certain of these materials are included in a mimeographed statement available from the division of materials.

Intracoastal Waterways May Aid Eastern Oil Deliveries

By HENRY D. RALPH

WASHINGTON, D. C.—A limited program for hauling heavy petroleum products in wooden barges on inland waterways and for construction of a pipe line across northern Florida has been agreed upon by government agencies concerned.

The House Monday by a vote of 121 to 85 refused to suspend its rules to consider the bill to authorize construction by Army engineers of a barge canal and oil pipe line across Florida and to improve the Gulf and Atlantic coastal canals. The bill can be brought up under the regular procedure at a later date.

However, the Office of Petroleum Coordinator can arrange for construction of a pipe line without congressional action. OPC is considering plans to ask the oil industry to build an 8-in. line across Florida with used pipe.

The program became known at hearings held recently by three congressional committees—the Senate committee on commerce, the House committee on rivers and harbors, and the House petroleum subcommittee. Much the same information was given all three committees by witnesses representing the Office of Petroleum Coordinator, Office of Defense Transportation, and War Shipping Administration.

Commission to Build Tugs

Under a program worked out jointly by these three agencies, the Maritime Commission will construct a number of new tugs, towboats, and wooden barges. Some of the wooden barges will be used to carry heavy oils and others will carry other cargo, such as molasses, now moving in barges which can be converted to handle oil. The wooden barges will be used only for Grade E oil, having a flash point of 150° or above, and will not be used in congested areas or locked waterways because of the danger of fire and pollution. They will be used on the lower Mississippi River as far north as Cairo, Ill., but not on the Ohio River, and may be used to a limited extent on the Gulf and Atlantic intracoastal canals.

The pipe line across Florida will run from Port St. Joe to Jacksonville, and the OPC is now negotiating with several companies for its early construction. It probably will be an 8-in. line because used pipe of that size can be obtained and because it is estimated that a line that size can handle all the oil which could be put into it and taken out of it by barge movement on the coastal waterways.

After several days of hearings the House committee on rivers and harbors voted a favorable report on a bill to authorize construction of the Florida pipe line and also deepening and widening the intracoastal canal from Texas to Florida and construction of a barge canal across Florida. The legislation is not necessary to secure construction of the pipe line, and the Florida canal and enlarged connections would not be completed for 2 or 3 years.

Advocates of greater use of inland waterways appearing at the hearings favored a huge program of barge construction, offering it as a solution to the East Coast oil shortage. Experts, however, pointed out many difficulties with the scheme such as: (1) There is a serious shortage of power equipment on all inland waterways and very few additional tugs and towboats can be built without diverting steel from essential war uses; (2) wooden barges are unsatisfactory from many standpoints but some can be built and used for limited purposes during the emergency; (3) the Atlantic intracoastal waterway from Jacksonville to Philadelphia has a controlling depth of only about 6 or 7 ft. and so cannot handle large oil barges; (4) even if sufficient equipment and crews could be found, the inland waterways could not handle enough petroleum products to supply all needs of the eastern states because of the long haul and slow turnaround.

In spite of these formidable obstacles, the agencies concerned have agreed on a program of constructing some additional barges and towboats to increase the transportation of oil along the Gulf and Atlantic coastal waterways and up the Mississippi and Ohio rivers.

Route of the proposed trans-Florida pipe line that would feed larger supplies of Gulf Coast petroleum into the intracoastal waterways system. Barges could move through the shallow intracoastal waterways with complete protection from submarines

One of the principal witnesses before all three committees was J. R. Parten, director of the Transportation Division of OPC.

Typical of the testimony of other witnesses was the statement of two officials of the ODT, who told the Senate commerce committee that plans are actively being considered for the construction of wooden barges to transport heavy fuel oil on inland waterways as a means of relieving the East Coast oil shortage.

They added that wooden barges have very limited utility for moving oil and should be considered strictly an emergency measure because of the impossibility of securing sufficient steel for standard barges. The wooden barges would be used both on the Mississippi River and on the barge canals paralleling the Gulf and Atlantic coasts. The latter route would require construction of a pipe line across northern Florida.

Waterway Said Suitable

Ernest Holzborn of the inland waterway section of ODT told the committee that the inland waterway from Jacksonville, Fla., to Philadelphia, Pa., is very suitable for the transportation of petroleum and has a practical depth of 10 to 10½ ft. throughout. The only problem, he said, is to deliver oil to Jacksonville and to obtain sufficient barges and towboats. The Gulf Coast waterway from the Texas oil ports to Appalachicola, Fla., he said, has a working depth of 9 ft., though some dredging would be needed at the eastern end and unloading facilities would have to be provided. He favored a pipe line across Florida, but declined to choose among several proposed routes.

Mr. Holzborn said it would be practical to use wooden barges for oil provided four conditions are met, as follows: (1) Sufficient power equipment also be constructed, since there is a shortage of towboats; (2) the oil transported be limited to Grade E, having a flash point of 150° or more; (3) they be excluded from locked waterways and congested areas because of the danger of fire and pollution, and (4) wooden barges be eliminated as rapidly as possible when normal conditions return.

He said the ODT is asking the Navy Department to relax its port regulations to permit the use of wooden barges for carrying oil under these conditions. This concession has been granted. ODT now will ask the Maritime Commission to proceed with the construction of the barges and towboats. He admitted that this project would not alleviate the shortage of gasoline and home heating oil, but expressed the view that it could fill demands for bunker oil and heavy fuel and relieve rail shipments to that extent.

Mr. Holzborn said ODT is asking for funds to experiment with one small wooden barge lined with cells made of a patented rubber-like product now used for lining airplane fuel tanks, with

the view to filling these sacks with oil which would conform to the shape of the barge. He thought this might permit the use of wooden barges in carrying gasoline and high-volatility products. He admitted the price probably would be quite high, but said the scheme would have an advantage in that the cells could be collapsed and removed and the barges used for bulk cargo on the return trips.

Use of the Mississippi-Ohio river system for transporting petroleum was described by Glenn Taylor of ODT. He said all northbound tonnage on this system is very heavy but southbound movement is very light, chiefly because of the decline in export trade. There are about 750 oil barges on the rivers, which are now delivering an average of 25,000 bbl. of petroleum daily to Pittsburgh, which can be shipped eastward by rail or pipe line.

A year ago, Mr. Taylor said, the regulated river carriers' committee asked for steel for a program of constructing barges and towboats which would have increased the capacity to deliver oil to Pittsburgh by 100,000 bbl. per day, but this application was denied for lack of steel. The committee has now drafted a revised program which includes construction of 100,000 tons capacity of wooden barges for hauling petroleum. He emphasized that these wooden barges would be subject to the same restrictions as outlined by Mr. Holzborn, and added that they would be used only on the lower Mississippi up to Cairo, Ill., and would not be taken into the Ohio River because of the dangers of fire and pollution. He added that towboats are needed more urgently than barges, and that there is little use constructing wooden barges unless steel is made available for an adequate fleet of towboats.

Mr. Taylor declared that the War Shipping Administration is interested in this program and has indicated that it may favor a program of wooden-barge construction.

Industry Council Submits Emergency Rubber Program

WASHINGTON, D. C.—A plan to maintain all mechanically usable passenger automobiles in service by providing new tires and recapping materials chiefly from reclaimed rubber and using very small quantities of crude rubber was presented to the Petroleum Industry War Council Tuesday by the advisory committee on rubber economics of the special committee on synthetic rubber. Text of the report was withheld for consultation with War Production Board officials who are understood to be considering a rubber-reclamation program for early announcement.

The committee on petroleum economics estimated the total essential demand for petroleum products in OPC District 1 from now through the first quarter of 1943 at an average of 1,297,000 bbl. daily, and available nontanker supplies at 1,182,000 bbl., or a daily deficit of 115,000 bbl. which will have to be met by some means such as protected tanker movements. Estimates include nothing for intermediate demand, estimated at 169,000 bbl. daily, elimination of which would cause extreme consumer hardship. To meet all essential and intermediate demands and provide working stocks during the heating season, additional transportation must be found for 347,000 bbl. daily.

The committee said preliminary reports on gasoline rationing showed gasoline consumption still 70,000 bbl. daily above minimum essential demands, chiefly because important parts of Distric 1 are not rationed.

The report said present estimates of nontanker deliveries are higher than previous because of continued improvement in railroad and barge movements, and achievement of estimates is based on further diversion of tank cars from other regions and early completion of pipe-line relocation projects.

The committee recommended:

1. Further reduction in District 1 consumption to approximate estimates of essential needs.

2. Further conversion to coal of all types of fuel-oil and kerosene burners.

3. Supplies should be made available in areas closest to District 1 by rationing the entire district, drawing more heavily from District 2 and less from Texas and Oklahoma and providing for recovery of higher costs of these supplies.

4. Provide tires for tank trucks now substituting for tank cars in all districts.

5. Deliveries above essential uses should go into winter fuel storage.

6. Refineries supplying District 1 should make more fuel oil and price ceilings should be adjusted accordingly.

7. Production in District 3 should be kept to levels recommended by OPC.

8. Available tanker deliveries should be made to New England to shorten rail hauls.

9. Present unbalance of East Coast stocks should be corrected by bringing in smaller proportion of residual fuel and more distillate fuel and gasoline.

10. Either subsidy or ceiling-price increase should be granted to compensate for nontanker methods of shipment.

Fuel-Rationing Organization Being Expanded by OPA

The Office of Price Administration this week continued organization of fuel-rationing personnel, presumably for the purpose of administering nation-wide restrictions on consumption of petroleum, if, as and when it is ordered by the War Production Board.

J. Bryan Miller, city manager of Wichita Falls, Tex., has been appointed fuel-rationing director in six states, including Texas, Oklahoma, Louisiana, Arkansas, and Missouri with headquarters at Dallas, Tex., where OPA southwestern regional offices are established.

Seubert Disclaims Fight Against Alcohol Rubber

CHICAGO, Ill.—Edward G. Seubert, president of Standard Oil Co. (Indiana), last week denounced the report that petroleum companies have been fighting the making of tires from grain alcohol so that they can have the synthetic-rubber field to themselves.

"Standard of Indiana has taken no such position and does not believe that other companies have done so," Mr. Seubert said. "At government request we are preparing to produce material from petroleum for the manufacture of butadiene, one of the raw materials from which synthetic rubber can be made. We have also undertaken to help manufacture the butadiene itself.

"Whatever the difficulties about manufacture of rubber from alcohol may be, monopolistic designs by oil companies are not among them."

Jerry Sadler Resigns From Texas Commission

AUSTIN, Tex.—Jerry Sadler, member of the Texas Railroad Commission whose regular term carried through until January 1, 1945, resigned his post Monday to enter the Army.

James E. Kilday, formerly of Houston, Tex., and now director of the commission's Motor Transport Division, was recommended by Mr. Sadler for appointment as his successor.

Mr. Kilday filed as a candidate for member of the Railroad Commission just after Mr. Sadler's resignation was tendered. Monday was the last day for candidates to file for the July primary.

Tulsa Engineers Install New Officers for 1942-43

New officers installed at the annual meeting of the Tulsa Engineers Club, June 1, include: Frank B. Taylor, district editor, Oil Weekly, president; C. V. Millikan, chief engineer, Amerada Petroleum Corp., executive vice president; C. S. Larkey, valuation engineer, Sinclair Prairie Oil Co., treasurer; Fred M. Carroll, assistant to area mechanical engineer, Shell Oil Co., Inc., vice president in charge of programs; P. Manion, Stanolind Oil & Gas Co., vice president in charge of membership; Ray E. Carter, chief engineer, Unit Rig & Equipment Co., vice president in charge of public relations.

New directors include the retiring president, H. R. Auerswald, assistant superintendent of the Gulf Oil Corp.; C. H. Bloom, superintendent of maintenance for Tulsa Board of Education, and Warner Lewis, Warner Lewis Co.

The junior group of the club elected Scott Thompson, chief engineer, W. C. Norris Manufacturers, Inc., president.

Compact Committees Study Secondary Recovery Aspects

OKLAHOMA CITY, Okla.—With oil-well completions down about 50 per cent from last year, oil production by secondary-recovery means is becoming increasingly important. With a shortage of steel for drilling and spacing restrictions required by Conservation Order M-68, operators are turning their attention more and more to the utilization of secondary recovery.

The Interstate Oil Compact Commission legal committee is now engaged in the study of legal phases of repressuring and recycling. The research and coordinating committee, composed of technicians from the various regulatory bodies of the member states, is accumulating factual and technical data on secondary-recovery projects.

With the decline in production in Illinois and Oklahoma, operators in those states are thinking more and more of utilizing secondary-recovery projects to recover the vast amount of oil left in the producing horizons.

Estimates show that Oklahoma alone has more than 500,000,000 bbl. of oil reserves that can be recovered by secondary methods. Since the inception of the secondary-recovery program in Oklahoma, over 56,000,000 bbl. have been recovered. Over 80 water-flooding orders have been issued by the Oklahoma Corporation Commission during the past few years.

STATE CAPITALS...

KANSAS

THE HIGHEST ALLOWABLE in the history of Kansas' oil production was fixed last week by the Corporation Commission which issued an allowable schedule providing for output of 281,900 bbl. daily, the figure recommended for June by the Office of Petroleum Coordinator.

The June allowable is 22,600 bbl. daily higher than authorized by the commission in May. The previous peak allowable was during last December when daily production of 264,000 bbl. was authorized.

OKLAHOMA

DAILY PRODUCTION of 436,600 bbl. during June was authorized last week by the Corporation Commission which accepted the recommendation of the Office of Petroleum Coordinator without variation. After deducting production of natural gasoline and condensate, it is estimated that allowable crude output this month will be 406,600 bbl. daily. Actual production in April was reported by the commission to have averaged 386,354 bbl. daily. The allowable in May was 408,500 bbl. daily.

Three new pools were placed in the unclassified prorated areas for the first time. They are Brookville in Pottawatomie County, allowed 520 bbl.; West Navina in Logan County, allowed 520 bbl., and the Pauls Valley pool in Garvin County, allowed 2,350 bbl.

It was decided that for the next 6 months the potential in the Oklahoma City-Wilcox pool should be reduced only one-half of 1 per cent a month instead of the 1 per cent a month reduction which has been customary.

CALIFORNIA

CALIFORNIA has been assigned a daily allotment of 691,900 bbl. for the month of June by the OPC and individual schedules will be in the hands of producers within another several days. The OPC estimated that a total of 38,900 bbl. per day of natural gasoline and condensate will be needed during June and with this deduction from the total the state has been assigned a net crude-oil allowable of 653,000 bbl. daily. This is 19,200 bbl. per day higher than the crude-oil allotment for the month of May when the total was fixed at 635,800 bbl. daily. The new arrangement is working out much better than previously with the result that crude-oil production is closely approximating established allotments.

There are still a few weak spots, notably in fields producing heavy crude oil where a number of wells are still shut in despite the growing shortage of this type of crude oil. The production committee for District 5, of which E. E. Pyles is chairman, is doing a splendid job and making steady progress toward harmonizing all details. It has been a difficult job due to some rugged individualists but the Bel-Air ruling has revealed that the OPC expects to crack down on any violator of curtailment. Subsequent penalties will be much stiffer and involve refiners and transporters as well as marketers. Every attempt is being made to induce producers to conform with the present conservation program and complete success is near at hand. The conservation committee at its next meeting will organize various subcommittees and make new appointments as producers have been electing members to the committee during the past few weeks to serve for the ensuing year.

LOUISIANA

A STATE-WIDE PUBLIC HEARING will be held in the Monteleone Hotel, New Orleans, June 15, at 10 a.m. for the purpose of taking evidence relative to market demand from producers and purchasers of crude petroleum and natural gas preparatory to setting oil and gas well and field allowables for the 62-day period of July and August.

All purchasers of crude petroleum and natural gas have been asked to present evidence at such hearing, or file notarized briefs by registered mail setting out their nominations, in triplicate, for the next 2 months on or before June 15.

ARKANSAS

RECOMMENDATION OF OPC that Arkansas production in June be prorated to a daily average of 75,300 bbl. daily was accepted by the Oil and Gas Commission in its current allowable order.

The commission, however, recommended that Coordinator Ickes examine testimony of operators that a firm demand exists for production of 85,453 bbl. daily. The commission especially invited OPC examination of the Midway field situation. Standard Oil Co. of Ohio signified its desire to purchase 5,000 bbl. daily in June; 5,500 bbl. daily in July; 6,000 bbl. in August and 6,500 bbl. daily in September.

A NEW TECHNICAL OFFICE was opened in Magnolia, Ark., by the Arkansas Oil and Gas Commission June 1. All reservoir-testing equipment, consisting of three completely equipped bottom-hole-pressure trailers, together with subsurface gages and calibrating equipment, has been moved from El Dorado to Magnolia. Portable gas meters used in determining operating gas-oil ratios, equipment for the testing of natural gas for its gasoline content, specific gravity and hydrogen sulfide content are also included in the equipment moved to Magnolia. The office is located near the quarters of the McKamie Gas Cleaning Co. on land leased by the state. The main building to house the equipment is complete, but one other structure is still under construction. All field engineering will be handled from the Magnolia office of the commission in the future.

Three engineering vacancies were filled by the commission last week. Jack Vestal of Arkadelphia, Ark., a student at the University of Oklahoma petroleum engineering school, has been employed as a junior engineer; J. R. Harrison of Aransas Pass, Tex., graduate of Texas A. & I. College, as natural-gas engineer, and Arthur G. Burki, Pittsburgh, Pa., graduate of the University of Pittsburgh, as petroleum engineer. These engineers were employed to fill vacancies caused by men leaving to join the armed forces of the United States.

TEXAS

A FAIRLY CONSTANT demand for Texas crude oil over remainder of this year is indicated by a recapitulation of purchaser nominations filed with the Railroad Commission at last week's hearing in Austin. The commission and oil operators recognize that changed conditions may alter the outlook from month to month.

The highest demand for crude during the last 6 months was contained in June nominations which totaled 1,393,168 bbl. daily. Nominations in most of the districts are unchanged from month to month but slight variations in the Gulf Coast, Southwest Texas, and North Texas are accountable for fluctuations in the monthly totals which are shown below.

Month—	Barrels daily
June	1,393,168
July	1,375,911
August	1,376,256
September	1,377,408
October	1,377,615
November	1,378,909

The nomination of 250,320 bbl. daily from the Gulf Coast slumps to 232,395 bbl. in July and then increases gradually to 234,070 bbl. daily in November. The North Texas nominations of 138,499 bbl. in June increase gradually, except for a slight reversal in September, to 139,079 bbl. daily in November. Nominations from East Texas are constant over the 6 months' period at 350,035 bbl. daily.

DIFFERENCES BETWEEN the Railroad Commission and the Office of Petroleum Coordinator on the volume of production required from Texas this month were modified in the Texas proration order issued last Saturday from the May discrepancy. Still, the first half of June proration allowable remained 219,578 bbl. daily in excess of the OPC estimate of demand. During the last half of May, the Texas allowable was 442,038 bbl. daily higher than the OPC recommendation.

The new allowable, including prorated and unprorated oils, is expected to yield 1,288,178 bbl. daily during the first half of June, a reduction of 113,860 bbl. from the calculated output in the last half of May. Net daily allowable in the new order is 1,249,788 bbl. daily from which the commission has made an arbitrary reduction of 5 per cent for underproduction. Production of natural gasoline and condensate during the first half of May is estimated at 101,879 bbl. daily which, added to the net prorated production of 1,186,299 bbl., places the estimated actual output at 1,288,178 bbl.

The commission was encouraged to regulate the output of natural gasoline and condensate in a message from Coordinator Ickes who said: "I find as a fact and hereby certify that a detailed analysis of the characteristics of the so-called distillate and condensate produced in the State of Texas established that these raw materials are, under present conditions, properly classifiable as 'crude petroleum oils' and the production thereof should, therefore, be regulated as such by your honorable commission."

The coordinator's statement on distillates and condensates may have some relation to the "Recycling Plant Order" issued May 19 by the commission, a summary of which appeared in the May 28 issue of The Oil and Gas Journal.

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

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No Place for Politics

Politics are moving in to further delay the solution to the rubber shortage, the most serious problem confronting this nation and its friends in carrying on the war to a successful conclusion.

Leaders of groups purporting to represent agricultural interests are demanding that a substantial part of the synthetic-rubber program be turned over to them to be juggled around with the view of securing the maximum political advantage.

These latest developments are reminiscent of the efforts of this same leadership a few years ago to force the use of alcohols, made from grains, as motor-fuel blending materials. Never was a proposal with less merit seriously offered the American consumer.

It was established beyond question that production costs of grain alcohol were three or four times that of gasoline. The alcohol, blended with gasoline, resulted in an inferior motor fuel with car owners faced with the threat of spending literally hundreds of millions of dollars in adapting their cars to the fuel. The new outlet for agricultural products, in relation to the total national output, was insignificant.

Despite the fact that this program, which was essentially political, did not have a single leg on which to stand, it persisted until organizations representing motorists got busy and it was certain there would be backfire in the motor and elsewhere if proponents forced the issue. Using farm products as raw materials, government subsidies have been provided to carry on experimental and small-scale manufacturing activities which have gotten nowhere in the production of petroleum substitutes comparable in cost and performance.

Now these opportunists are striving for a foothold in the synthetic-rubber plans and at the same time openly boasting that once this is accomplished they can revive the costly program for forcing unwanted alcohol-gasoline blends on millions of motor-vehicle owners.

They have held hearings at Washington and smeared those whose foresight has given this nation the only protection it has in manufacturing products to offset the loss of imported natural rubber. As usual they are weak on facts and strong on accusations. They seek to befog the accomplishments of others by making general claims and charges, minus supporting facts.

A great deal is said about what has been done in European countries with alcohols from farm products, overlooking the fact that the manufacturers either did not have the petroleum hydrocarbons for their plant operations or were not familiar with the petroleum processing methods. Furthermore, these foreign operations are based on a few thousand tons of rubber yearly while this country is seeking a million-ton annual output.

If there is any one place over another where politics need to be discarded, it is in the solution of the multi-headed rubber problem. If those claiming to represent the farmer have anything specific to offer they should get off the mourners' bench and state what it is, as the petroleum, rubber, and chemical industries have already done with important accomplishments to point to.

A new art in this country has to be perfected before present rubber supplies are exhausted. The perfection of large-scale manufacturing operations presents many chemical and engineering problems, the solution of which will require the concentrated efforts of those most familiar with the scientific and technical principles involved. So important is rubber to military and civilian activities that every day's delay must be subtracted from the entire war program.

The politically minded should either suspend operations for the duration or direct their energies to activities not so closely related to the winning of the war and to life and death to thousands of Americans.

Synthetic-Rubber Plans Move Forward Despite Confusion

By H. STANLEY NORMAN

DETAILS of the synthetic-rubber program, probably the most confused issue of all the war-production plans, are growing less vacillating with the passage of time. There are conflicts in opinions of government administrators in whose hands rests the authority to deal summarily with the confusion. Still, some elements of order are appearing and progress is reported in the chief objective of producing 1,000,000 tons of synthetic rubber annually.

Added to the previous confusion is the current campaign of the congressional farm bloc to force government agencies to provide a position in the program for butadiene recovered from alcohol which would be derived originally from agricultural products.

Dual Interest in Rubber Program

The oil industry has a dual interest in the synthetic-rubber program. Production of the components, butadiene and styrene, is admittedly secondary to the broader problem of maintaining as many automobiles as possible in regular service, if the two questions are viewed from a strictly selfish standpoint.

Willingness of refiners to disturb normal operations, risk financial losses and increase expenditures for engineering and research must be accepted as a contribution to the war program wholly aside from emoluments that may accrue as a result of this wholehearted cooperation.

Out of the confusion a few pertinent tangibles now stand out. They are:

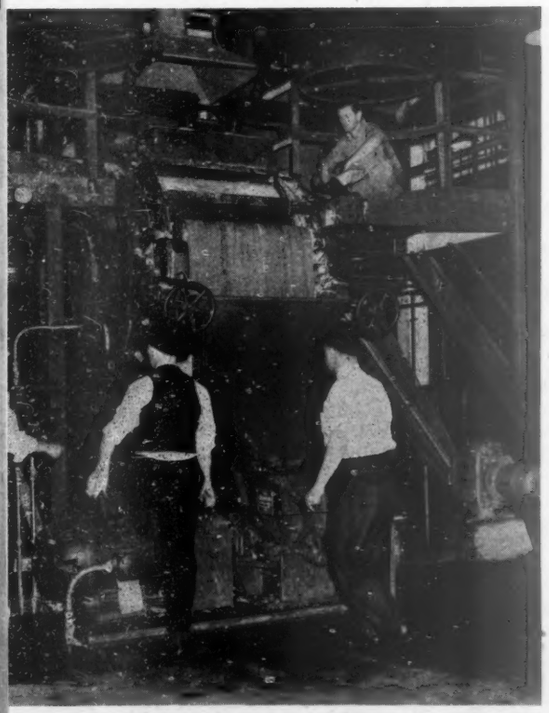
1. Rubber for nonessential civilian tires will not be available before the latter part of next year or possibly the fore part of 1944.

2. The Rubber Reserve Corp. and the Defense Plants Corp., both subsidiaries of the Reconstruction Finance Corp., now plan eventual production of 1,000,000 tons of synthetic rubber, including 200,000 tons derived from alcohol, added last week to the previous program of 800,000 tons.

3. Friction between petroleum refiners, rubber companies and the chemical industry is still apparent in negotiations as various interests jockey for position.

4. Coordination of production schedules and allocation of materials for the necessary refinery facilities is still lagging.

This new synthetic-rubber polymerization plant of Goodyear Tire & Rubber Co. started production last week at Akron, Ohio



More Realistic Attitude

The petroleum industry has succeeded in forcing a more realistic attitude toward gasoline rationing and some uniformity is beginning to appear in the utterances of Washington officials, admitting that restrictive plans for motor-fuel consumption are the outgrowth of necessity for conserving rubber rather than a shortage of petroleum supplies and transportation. This reality was reasonably well understood in the petroleum industry, but oil men insisted upon clarification from Washington to remove confusion among the general public.

Plans for producing about 20 per cent of the total synthetic rubber from ethyl alcohol do not necessarily exclude the oil industry from this phase of the program. Production of ethyl alcohol from petroleum gases is a process with which oil refiners have been familiar for some time and substantial quantities of this chemical are now produced by the industry.

Figures on supply and demand for rubber presented March 5 by Leon Henderson, director of civilian supply, War Production Board, before the Senate committee investigating national-defense activities, have not been supplemented by an over-all summation incorporating additions to the production program made more recently. At that time, when the synthetic-rubber goal was 600,000 tons annually, it was calculated by Mr. Henderson that half of the projected capacity would be in operation in 1943. When testifying, however, Mr. Henderson was skeptical that the production figure of 300,000 tons could be attained next year. Since March the petroleum industry has made substantial progress in developing techniques that will increase yields of butadiene, giving a more attainable aspect to production goals.

No responsible government official has made an upward revision in estimated production of synthetic rubber, but refiners, assuming that steel and other critical materials necessary for plant construction, will be made available on schedule, are reasonably certain that production ambitions can be met and even possibly exceeded.

The synthetic-rubber program as now constituted breaks down into approximately these quantities: butadiene types from petroleum gases, 700,000 tons; butadiene from ethyl alcohol, 200,000 tons; butyl from isobutylene and a small percentage of butadiene, 60,000 tons; neoprene, 40,000 tons. Other rubber-like plastics, desirable for many of the specialty products previously made from natural rubber, may account for 50,000 tons of material. Developments in the nontire synthetic rubber are claimed to be moving ahead rapidly and they may eventually gain a more important position in the expanding program.

There isn't much question but that the 200,000 tons of production from ethyl alcohol was added to the program last week as a gesture to the agricultural bloc. Contracts for the supply of ethyl alcohol, however, still must stand the test of economics and if refiners can produce the requirements without impairing capacities for other war materials it is possible that they will be called upon for the raw charging stock needed in this phase of the program.

Little has been disclosed about the costs of producing butadiene by dehydrogenation of butanes and butenes compared against recovery from ethyl alcohol. It is understood, however, that production of butadiene from alcohol starting with agricultural products as the base has approximately the same relationship to petroleum gas processes as the cost of alcohol bears to gasoline as a motor fuel, from two to three times more costly. Still, the decisions on what industries will supply the raw materials will not be made strictly on a basis of cost. The consideration of equipment required to recover the butadiene is of just as much importance, possibly more, in deciding whether distillers operating on wheat, corn and other grains will do the work or whether the assignment will be given petroleum refiners.

Present Construction Status

Facilities for the production of about 250,000 tons of buna-S rubber now are in various stages of construction. Contracts have been executed between 25 corporations, the Defense Plants Corp. and Rubber Reserve Co., covering facilities for production of 700,000 tons of buna-S synthetic rubber annually. When disclosure was made in the early part of April that definite contracts had been signed, the War Production Board followed with an authorization for increasing the total program to 800,000 tons, including 100,000 tons of butyl rubber and neoprene.

No announcement has been made by Secretary Jones, head of the RFC and its subsidiaries, of contracts covering the 100,000 tons last added to the buna-S program or of the 200,000 tons he said last week had been authorized from ethyl alcohol. This would leave 300,000 tons of the total expanded program outside definite commitments by the Government and industry.

The WPB went on record April 25 declaring its intention to give the 700,000-ton buna-S program all the priority and allocation assistance

needed to assure the production of not less than 350,000 tons during the calendar year 1943.

Greater efficiency and higher yields obtainable from plants designed for the specific purpose of producing butadiene and aviation-gasoline components have influenced the Government and industry to favor this type of installation. At least two of the butadiene plants contracted by DPC and RRC with petroleum refiners have capacities ranging from 75,000 to 100,000 tons of synthetic-rubber components annually. These two installations, one on the Gulf Coast and the other in the Middle West, will draw their requirements of gas oil charging stock from conventional refineries within a limited radius of their locations. Other smaller butadiene plants which will operate along the same general lines as the bigger units are under construction or being designed for installation on the Pacific Coast, the Texas Panhandle, Illinois, Ohio, Kansas, and on the East Coast.

Petroleum refining and chemical companies are to produce the components of synthetic rubber under contracts with Rubber Reserve Co. on a cost-plus-fixed-fee basis graduating downward from 0.69 to 0.335 cent per pound. The rubber companies operating the polymerization plants for converting butadiene and styrene into latex will be paid fees ranging from 0.7 to 1.5 cents per pound.

Plants for the production of synthetic rubber, including facilities for recovering butadiene and styrene as well as polymerization plants for converting the components into latex, cost approximately $1,000 per annual ton of production. The expanded production program indicates that 1 billion dollars will be spent among oil refiners, chemical plants and rubber companies. Some engineers contend the figures are on the conservative side because of the rush construction requirements, labor shortages and other intangibles.

Butadiene Rubber Still Main Key in Relieving Shortage

WASHINGTON, D. C.—The supply of rubber in the United States and means of acquiring and producing it are far short of unrestricted demands during the next 2 or 3 years.

This is the conclusion of all who have studied the situation from an objective viewpoint since Pearl Harbor. The only dissenters are those who apparently have some axe to grind. Congressional committees have been told that reclaimed scrap would provide sufficient rubber for all purposes if a present alleged monopoly of the business were broken, that this or that as yet unproven invention or new process would produce ample and satisfactory synthetic rubber in a short time, that guayule, Russian dandelions, or some other plant which could be grown in the United States could solve the problem, or that tropical regions of this hemisphere from Mexico to Brazil could furnish an adequate supply if properly tapped. But all these possibilities embrace many uncertain factors and while they are all being investigated and promoted the government authorities are not putting much reliance on them in their plans.

The fact remains that the economy of this country is geared to rubber, and the enemy now controls more than 90 per cent of the world's commercial production of crude natural rubber and threatens to shut off our access to the small amounts available from India, Ceylon, and Africa. Moreover, the United States must supply most of the rubber needed for military and essential uses by all the United Nations.

For many months before Pearl Harbor this Government attempted to build up a stock pile of crude rubber. The full goal was not achieved for a variety of reasons, some of which have been the subject of severe criticism by congressional committees. While stocks last December were considerably above normal, the fact remains that the nation's biggest stock pile of rubber consists of the tires now in the hands of vehicle owners.

This fact explains the strenuous efforts being made by the Government to conserve the use of existing tires, whether by gasoline rationing or any other means. Officials in position to know, including congressional committees which have made a thorough study of the situation, are unanimous in saying that there can be no tires for any but the most essential vehicle uses for at least 2 or 3 years.

The exact position of the United States is considered a military secret. The Truman subcommittee figures were based on the combined supply and requirements of the United Nations. The normal consumption of rubber for civilian uses in the United States is something under 600,000 tons a year, but it was nearer 700,000 tons in 1941. On top of this there is now an enormous military demand, the extent of which is not publicly known. Stocks on hand at the beginning of this year are supposed to have been in the neighborhood of 900,000 tons, and rubber in tires in the hands of vehicle owners has been estimated at between 1,000,000 and 1,500,000 tons.

By stepping up the synthetic program and forcing drastic curtailment in the military demands of United States and Allied forces, the War Production Board estimates that we can get through 1944 with no stocks left over. By that time synthetic plants should be producing at the rate of around 1,000,000 tons a year. Meanwhile, more supplies than are now counted on from the reclaimed rubber program, from guayule and other domestic plants, from Brazil and Central America, and from synthetic production may become available ahead of schedule. But military demands are so unpredictable and so large that any increase in the supply probably will be absorbed there.

For these reasons the Truman committee, which made a thorough study of the whole situation, joined with administrative officials in declaring flatly that there will be no new tires for civilians for 3 years.

Few Advanced in Construction

Secretary Jones told the House petroleum subcommittee last week that of the 25 synthetic rubber and butadiene plants now under contract, only a few are well advanced in construction. He estimated that around 100,000 tons capacity would be completed by the end of this year, another 250,000 tons by the middle of next year, and practically all by the end of 1943.

The same committee was told by Wright Gary, director of refining of the Office of Petroleum Coordinator, that it would take about 24 months to complete construction of the present petroleum butadiene plants, due to the difficulties of obtaining equipment. After completion, he said, it would take from 3 to 6 months before a plant reached maximum production.

Mr. Gary told the committee there is some hope of getting additional supplies of butadiene in the meantime by utilizing thermal process by small plants not equipped for catalytic cracking. He said this would be more expensive and the technique is not well known, but it would provide business for some refineries which might otherwise have to close down. He said there is no

Here is the summary of rubber resources and demand presented by Leon Henderson, price administrator and director of civilian supply, to the Truman Senate committee. The figures are based on a 25 per cent reduction in demand in the three classes of consumption ordered by WPB.

Supply—	1942	1943	1944
New supplies during year			
Crude-rubber shipments	434,000	135,000	98,000
Synthetic rubber	25,000	300,000	600,000
U. S.-grown guayule	.....	1,000	5,000
	459,000	436,000	703,000
Demand—			
United States military forces, lend-lease, South American export	306,750	462,750	462,750
U. S. civilian	150,000	123,750	123,750
Rest of non-Axis world	198,750	198,750	198,750
	655,500	785,250	785,250
Result—	Deficit	Deficit	Deficit
Supply minus demand	196,500	349,250	82,250
Total stocks at beginning of year	693,000	496,500	147,250
Net stocks end of year	496,500	147,250	65,000

Note: Since Mr. Henderson's analysis was prepared the synthetic-rubber production goal for 1943 has been raised to 350,000 tons and the total quota increased to 1,000,000 tons whereas his calculations were based on aggregate yield of 600,000 tons.

disposition on the part of the oil industry to monopolize the butadiene or synthetic-rubber industry, and that large and small oil companies are cooperating in the program.

Some relief may come from an increased program of reclaiming used rubber. WPB, OPA and RFC are cooperating in a plan for financing more rubber reclaiming plants and collection of scrap rubber, and detailed announcements are expected within a few days. At present about 26,000 tons a month are being reclaimed, and this will be boosted to at least 35,000 tons. The amount of scrap rubber in the country which might be reworked is variously estimated at from 500,000 to several million tons.

Since rubber is the key to the better part of the oil, transportation, and military situations, Congress is showing intense interest in the problem. The investigations have been replete with charges of short-sightedness, special interest, patent monopolies and various sorts of wrongdoing, without much actual foundation.

Rubber Polymerization Plant Starts Production at Akron

AKRON, Ohio. — Synthetic-rubber production started last week from a government-sponsored addition to the Goodyear Tire & Rubber Co.'s plant here.

Officials of the company disclosed that the new addition with its annual capacity production of 15,000 tons probably will be in full operation within a short time, with additional facilities to provide another 15,000 tons annually scheduled for completion late this year.

As with Goodyear's privately financed original plant completed last June, production from the two additions is confined exclusively to U. S. Army and Navy requirements. The additions supplement the plant which Goodyear inaugurated nearly a year ago to produce about 2,500 tons of synthetic rubber per year. Goodyear first produced synthetic rubber from a pilot plant beginning in November 1940.

Construction of the first addition to the original plant started last July with a $400,000 government grant, predicated on expanding the original plant's capacity by 10,000 tons annually. Soon another 5,000 tons annually was authorized. Before the first addition was completed, the Government ordered expansion to still another 15,000 tons annually. It is this project which is expected to go into service about November.

Most of the synthetic rubber from the addition placed in operation last week will be devoted to tires for the Army and Navy, with some being used for oil-resistant engine fittings, gaskets, and couplings. Since the original plant was placed in operation, practically all its output has been on bullet-seal gasoline hose and tanks for airplanes.

From three separate production-line units within this addition will come three separate streams of synthetic rubber. In other nearby Goodyear plants the transformation into completed products will be finished.

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Allocation of Refinery Runs In District 3 Approved

WASHINGTON, D. C.—A plan for allocation of refinery runs in District 3 has been approved by the Office of Petroleum Coordinator. It was drafted by the general committee for District 3 as directed by OPC Recommendation 33. The plan requires the refining committee of the district to determine each month the demand for products and allocate it among all refineries dividing them according to those producing war products as specified by OPC and those not producing war products and also as between seaboard and interior refineries.

Allocation is to be based on figures from OPC and other District 3 committees as to transportation available during the month, exports, war products production and consumption in the district. Refinery operations are then to be allocated first to produce required war products with minimum crude runs and then to operate all nonwar refineries on a percentage of average crude runs in the last 6 months of 1941. If this figure is not sufficient to operate all refineries at level of production of nonwar products by refineries making war products then nonwar products' allocation of the latter are to be reduced and they must make exchanges or processing adjustments in order to maintain production of war products but share remainder of business equitably with nonwar refineries.

If transportation facilities are not available for all production under this schedule the district transportation committee is to allocate available facilities first to war products, second to nonwar products of war refineries as required to maintain production and third, to other refineries equitably.

If there is still a shortage of transportation the committee is to establish loading schedules. The refining and production committees are also to estimate the volumes, grades and origins of crudes needed by war products refineries in District 3 each month. The plan will go into effect initially only as to seaboard refineries in the Texas-Louisiana Gulf Coast area.

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A. V. Bourque Made Chief Of ODT's Tank-Car Section

WASHINGTON, D. C. — Appointment of A. V. Bourque as chief of the Section of Tank Car Service, recently established to exercise nation-wide control over the movement of tank cars in furtherance of the war effort, was announced last week by Joseph B. Eastman, director of the Office of Defense Transportation.

Since July 1941, Mr. Bourque has been tank-car consultant, first for Ralph Budd, transportation commissioner of the Advisory Commission to the Council for National Defense and later for Mr. Eastman upon his appointment as director of defense transportation. He has also served as executive secretary of the tank-car service committee.

Beginning June 1, effective date of General Order ODT 7 setting up the Section of Tank Car Service, no tank car may be moved in a short-haul operation without special or general permission of the section, except cars specifically exempted.

No permits will be required for cars hauling petroleum or petroleum products into 17 eastern states and the District of Columbia from another state or into the states of Washington and Oregon from another state.

Also exempt from the permit requirements are tank cars hauling any commodity to points more than 100 miles away, as measured by the shortest available published rail tariff route, regardless of whether shipment actually is made over such a route or a longer one.

More than 3,000 applications for special or general permits have been received by the Section of Tank Car Service. The section attempted to clear all applications by June 1 so that no necessary operation would be delayed for want of a special or general permit.

Information contained in the applications will provide the foundation on which the nation-wide system of control will be built.

Purposes of the tank-car control system, as stated in General Order 7, are "to make available tank cars and other transportation facilities and equipment for the preferential transportation of material of war and to prevent shortages of equipment required for such transportation . . . to conserve and providently utilize transportation facilities and service; to expedite the movement of commodities normally moving by tank cars, and to coordinate the operation and distribution of the nation's total tank-car supply. . . ."

After June 1 the Section of Tank Car Service has authority to redistribute and assign tank cars in any manner which it deems necessary in carrying out these objectives.

Circuit Court Rejects Madison Case Appeal

CHICAGO, Ill.—The United States Circuit Court of Appeals for the Seventh Circuit Monday refused to hear an appeal from a decision of federal Judge Patrick T. Stone of Madison, Wis., in a case for triple damages brought by S. P. Leonard, of Lidgerwood, N. D., against 10 major oil companies involved in the Madison oil cases which were heard almost 5 years ago. The Circuit Court sitting here dismissed the appeal for want of jurisdiction.

Judge Stone, who also presided at the original Madison cases, had held in December 1941 that the plaintiff, a gasoline jobber doing business as the Hi-Test Gas & Oil Co., could not recover the amount of any increase in the price of gasoline resulting from the buying program for which the defendant companies were brought to trial in October 1937. The defendants in the Leonard case were: Socony-Vacuum Oil Co., Inc., Wadhams Oil Co., Cities Service Oil Co., Continental Oil Co., Pure Oil Co., Shell Oil Co., Inc., Sinclair Refining Co., Mid-Continent Petroleum Corp., Phillips Petroleum Co. and Skelly Oil Co.

Mr. Leonard was seeking treble damages, but Judge Stone had held that it would be necessary for a jobber to prove that he did not pass on the increase to his customers.

In dismissing the Leonard appeal, the Circuit Court in Chicago held that it did not have jurisdiction to hear an appeal from a partial summary judgment granted by Judge Stone.

Return of Normal Outlets Hope of Small Refiner

By W. T. ZIEGENHAIN

IN the United States there are now approximately 450 operating refineries. Under the strict war economy such as we are approaching, the number could be reduced. Government officials recognize this as a fact, but so far have not made a definite recommendation. The question naturally arises in the minds of the thousands of men directly and indirectly connected with oil operations, "What is in store for refineries, particularly the small ones?"

This question has been widely discussed and there appears to be no uniformity in the answers except that large and small refiners agree alike that for the good of the country and oil operators, every effort should be made to retain approximately the present oil-industry structure.

To do this, it is evident that adjustment upward in refined-oil prices must be granted by the Government in order to compensate for the loss of markets brought about by gasoline rationing and technological developments, which latter factors render ordinary refinery equipment obsolete in a comparatively short time.

Aviation Gasoline

The most important change came when the war agencies asked for large quantities of 100-octane aviation gasoline. This was followed by requests for substantial quantities of toluene. More recently these same agencies have asked for a large plant capacity in which to develop the production of synthetic rubber.

The exact quantity of each to be requested has undergone repeated revisions but in every case the new figure has been higher. The basic materials needed for the manufacture of each is not available in substantial quantities in the crude oil itself but can be made by ordinary thermal and chemical means and can be done best in the relatively large refineries and gasoline plants. For this reason the industry logically assumes the role of principal supplier. The industry has the organization and a part of the equipment to manufacture the required products, but in assuming this position it has placed itself in direct competition with other potential manufacturers who would utilize coal and water as a source of the raw materials. In Germany, for example, an important source of such hydrocarbons is the ordinary potato.

Natural Responsibility

The refining industry can more readily assume its new work of utilizing petroleum because the refinery cracked gases and natural gases are by far the easiest and purest sources of hydrocarbons. For example, even under the present restricted plan for producing and refining crude oil there are more than 500,000 tons of hydrocarbons turned out daily from these plants. Normally, of course, this quantity is in the form of motor gasoline, fuel oil, and lubricants.

If all these hydrocarbons could be made into the form of toluene, for example, the refining industry could supply the explosives for an air raid every 8 hours such as that just completed by the R.A.F. over Cologne, Germany, and which has since been declared the largest air raid in history. Or, if this quantity of hydrocarbons could be in the form of butadiene and styrene, the refineries could supply synthetic-rubber components within a period of 2 days sufficient to take care of the normal rubber needs of the country for a year.

But these facts simply tend to emphasize the difference between having hydrocarbons in the form of petroleum as nature supplied and in the form of commercial products for use in highly specialized engines of war. And they might help to explain why so much added investment in equipment is needed among refiners to bring about the conversion of petroleum to commercial synthetics. They also help to explain why the industry is sometimes classified as "chemical."

Large Expenditures Needed

The combined programs for making 100-octane aviation gasoline, toluene, and synthetic rubber components will call for the expenditure of approximately $1,000,000,000. Obviously expenditures and manufacturing operations placed upon such a scale favor the concentration of manufacturing facilities and they tend to force the exclusion of small refineries as they are now constituted. But that does not mean the end of small refineries nor the substantial alteration of their relationship in the oil industry to the thousands of oil producers supplying their plants. In fact, the lack of rubber is solely responsible for any immediate need to curtail motor-fuel consumption. This in turn is the only justification for now questioning the position of the small refiner.

Certainly the order to curtail his gasoline production 20 per cent and increase his fuel-oil production by a like quantity was not welcome to him for it meant the loss of at least 30 cents a barrel on every barrel of crude run through the plant. The accompanying table suggests the details of the calculation. It seems reasonable then that the immediate future of the small refiner is dependent to a very large extent, first, upon a price adjustment upward for his fuel oil and, second, the early solution of the country's rubber problem.

Rubber Holds Answer

This, of course, places synthetic rubber in a very important position and in this position it means that the larger refineries must be encouraged to produce synthetic-rubber components before the smaller refineries can expect to resume normal gasoline sales. And general encouragement has come to small refiners in the past week in the expanding belief that synthetic tires will be available to civilians early in 1944. One qualified student of the situation has stated that war or no war, this country would be exporting rubber substitutes by 1946. If synthetic rubber holds the clue to the welfare of the small refiner, the industry then should rally around every effort to produce these substitutes and without regard to whether the interest happens to be centered in a major refiner, a chemical company or in the rubber industry itself. Without question, the principal concern now should be the winning of the war and then the return to normal, peacetime conditions will guarantee the return of normal markets.

REFINERY REVENUE PER BARREL OF PROCESSED CRUDE

(Based on Mid-Continent Operations)

Normal Operation:

Yield—	Percentage of crude	Gallons per bbl.	Spot price per gal.	Revenue from each bbl. crude
Gasoline	52.2	21.92	.055	$1.21
Residual fuel	26.2	11.01	*.850	.22
Kerosene	6.6	2.77	.045	.13
Distillate	13.5	5.67	.035	.20
Loss	1.5	.63	...	....
Total	100.0	42.00	...	$1.76

Curtailed Operation:

Yield—	Percentage of crude	Gallons per bbl.	Spot price per gal.	Revenue from each bbl. crude
Gasoline	32.2	13.52	.055	$0.74
Residual fuel	44.2	18.57	*.850	.37
Kerosene	7.6	3.19	.045	.14
Distillate	14.5	6.09	.035	.21
Loss	1.5	.63	...	....
Total	100.0	42.00		$1.46

Loss in revenue from products recovered from each barrel of crude—$0.30.
*Per barrel.

Pacific Coast Lubricating-Oil Prices May Strengthen

By L. P. STOCKMAN

THE Penant Oil & Grease Co. of Los Angeles, Calif., was granted an injunction early last week against reclaimed-oil dealers forbidding defendants to claim their product is of Pennsylvania origin. This ruling may stabilize prices of lubricating oil on the West Coast. The suit was instituted several months ago and seven defendants were involved. Cross complaints were dismissed by the court with prejudice which means they cannot be refiled.

Another development of importance last week was a thorough discussion of conditions confronting marketers with H. G. Mellon, deputy city attorney of Los Angeles, who advised representatives of several marketers and refiners that prosecution can be instituted against unscrupulous refiners and marketers, under five different laws, who misrepresent any commodity. Action will be taken immediately to prosecute station men and others who have made a practice of diluting Ethyl gasoline by blending in a quantity of inferior motor fuel. Enforcement will be carried out by the state Bureau of Weights and Measures as well as by the city attorney's office. Refinery employes have also been lax in some cases by permitting trucks to fill up partly with Ethyl and partly with Q fuel and then issuing a rebrand letter for Ethyl on the entire load. Mr. Mellon told those present that "Diluting Ethyl gasoline so that it has a lower octane number than provided by Ethyl constitutes misrepresentation and fraud and will not be permitted. There may be a temptation in times like these to meet competition by cheapening Ethyl gasoline but our enforcement offices are on the job and we intend to clean up this destructive practice." Violators will be prosecuted under (1) the statute concerning false advertising and misrepresentation; (2) the statute concerning written consent to use trade name; (3) the California oil and gas substitution act and other antifraud statutes.

Northwestern Stocks Increased

The West Coast oil industry has done a splendid job in building up refined-oil stocks in the Pacific Northwest and as a result the situation has improved to such an extent that, although the 33⅓ per cent restriction in deliveries will remain in effect, the Government has canceled the announced rationing and 50 per cent restriction on deliveries scheduled to have become effective June 1. Since February 19, more than 62,000,000 gal. of petroleum products have been shipped into Washington and Oregon by 6,500 tank cars, 300 trucks and other means. This movement is continuing and will be necessary because in June and July of last year sales in Washington of gasoline alone totaled 34,141,628 gal. and 41,065,357 gal., respectively. Sales of gasoline in Oregon during the same period aggregated 26,145,740 gal. and 25,268,849 gal. This means that approximately the same amount will have to be moved into these areas during the next 2 months, less, of course, the amount of the restriction which remains unchanged. Despite the excellent job of moving considerable quantities of petroleum products into the Pacific Northwest, California refiners and marketers are being severely penalized because of frozen prices. No offer has been made to relieve marketers from the substantial loss being sustained by this added transportation cost.

California marketers will watch with interest the action taken with respect to credit cards by the Petroleum Industry War Council at its June meeting. It has been recommended in some quarters that credit cards be discontinued for the duration of the war, but no definite action has been taken along this line except by a few California marketers. One large independent marketer pulled in its cards over a month ago and is now selling on a strictly cash basis.

California gasoline sales for the month of April 1942 indicate a very definite decline is taking place in demand and that a further loss should be encountered later this year. This reduction reflects slower driving, elimination of long drives and the pooling of transportation by various employed men and women. Traffic signals have in many instances been timed to permit a slower flow of automobiles. April gasoline sales in California were 16.11 per cent under sales in April of last year but it should be remembered that April of last year was an exceptionally high month as service stations were accumulating stocks ahead of higher taxes. A slight drop was evidenced in March sales of gasoline, but April sales showed the first substantial decrease. Eliminating all abnormal conditions prevailing in April of last year tends to indicate that the net reduction in sales in April 1942 approximated 10 per cent. It is quite likely that sales during the forthcoming summer months may be substantially less than this because very few vacationers are going to take long drives this year. The rubber problem will take care of this angle.

Expressions on Current Questions

By PAYNE RATNER
Governor of Kansas

KANSAS is deeply concerned by reports that gasoline rationing may be extended to include the Mid-Continent area, despite its vast oil production and the fact that gasoline supplies, already at their highest peak, are even now mounting higher and higher.

Kansas is now cooperating 100 per cent in every phase of the war effort and of course will continue to do so. But our people are entitled to know why these sacrifices are being made. If they are not informed, the effect might be disturbing to morale and to the unity of effort the country must maintain.

Certain information from usually reliable sources in Washington indicate that gasoline rationing is not actually necessary in this Midwest area, but is to be imposed in order to placate those rationed in other sections where such rationing is apparently necessary. Under this theory, if one child in a large family became ill, the parents would desire to spread the illness to all children in the family on the theory that misery should have company. If this is the real objective of rationing in Kansas and states in this area, then our people will seriously object.

Our people fear the economic shock which would result from such drastic restrictions upon one of our principal industries. Harmful repercussions would be felt in every line of business and economic life and every citizen would feel the effects. It is feared that such a move would impede instead of help the successful prosecution of our war effort which is paramount in all our minds.

State government in this area would suffer. A large part of the funds with which to maintain a highway system capable of meeting war requirements would be lost. Other essential state governmental functions would be crippled by resulting loss of revenue.

If rationing is for the purpose of saving rubber it is felt by our citizens that idle cars and tires would deteriorate and could be of little use in either war or economic effort. This economic waste seems unwise at a time when all our resources should be utilized to the utmost.

If gasoline rationing is a prelude to the commandeering of cars and tires, should not the people be told in advance of such plans and the intermediate step of rationing be eliminated? Also, should not the Government first utilize the hundreds of thousands of cars and tires which are still frozen under the ban in the storerooms of motor-car and tire dealers throughout the country?

Because these questions have such a vital bearing in our economic life and our war effort, I suggest and urge that a conference be held at which governors or their representatives from the Mid-Continent oil-producing states may have an opportunity to go over the situation with federal officials before final determination is made.

Air Transport Suggested As Way to Obtain Rubber

By ALEXANDER BOYNTON
President, Frontier Oil Co.

MY company has shut down 46 pumping wells from which we sold the oil at $3 per barrel after the first World War. I know this is a different war, but is it not the same world? Or is it?

Our employes are now on half time at half pay, and their pay will have to stop when our storage is full.

Why is it that Hitler is massing a great army to fight for oil while we, in the same war, discourage the production of oil?

Why not fight the Japs and Germans and quit fighting the people at home? Parents do not have to whip children just because they have them.

Why not build landing fields in the great rubber-producing forests of Brazil and get by air all the rubber we need?

Is it the same people who plowed under cotton and burned wheat who now propose to cut off our legs to help win a footrace?

Are the same people who killed the hogs and cattle now offering to help us earn more taxes by paralyzing all industry that must pay these taxes?

Maybe they have figured it out in Washington that if we wear out our tires, they will be gone, but if our tires rot we will still have them.

We are going to win this war, but let us try to win it because of the things we do right, and not in spite of the things we do wrong.

Majewski Endorses Ickes for WPB

By B. L. MAJEWSKI
Vice President, Deep Rock Oil Corp.

I HEARTILY endorse your views that Mr. Ickes be made a member of the War Production Board. He has done an excellent job as petroleum coordinator for war and can do a better job if he is appointed to the War Production Board.

Oil Companies Set New Peak In Rail Shipments to East

WASHINGTON, D. C.—Tank-car shipments of petroleum and petroleum products into the eastern district reached a new high figure of 706,800 bbl. daily during the week ended May 23, according to reports to the Office of Petroleum Coordinator.

This was an increase of 22,318 bbl. over the preceding week, when movement averaged 684,482 bbl. a day.

Oil shipments from California to Oregon and Washington declined, meanwhile, from a record of 29,636 bbl. daily in the week of May 16, to an average of 16,296 bbl. for the week ended May 23.

Service Uses 53,400 Cars

In shipping 706,800 bbl. daily into the East, the 28 companies participating in this movement reported that they loaded 23,560 cars. Including cars that were on the way back for reloading, it is estimated by OPC officials that the East Coast service was employing 53,400 cars, taken largely from other sections of the country.

On the basis of an average of 210 bbl. per car, the 23,560 loaded cars carried the equivalent of 4,947,600 bbl. of petroleum and petroleum products. Until last week, the capacity of the average tank car in the west-east service was estimated to be 225 bbl. A careful analysis indicates, however, that the average loading is now 210 bbl. per car, due to the recent heavy increase in the number of smaller cars being used in this service.

Eastern shipments were: Allied Oil Co., 48 cars; American Bitumuls, 35; American Mineral Spirits Co., 143; Arkansas Fuel Oil Co., 168; Ashland Refining Co., 98; Asiatic Petroleum Co., 39; Atlantic Refining Co., 3,579; James B. Berry Sons Co., 8; Canfield Oil Co., 2; Chalmette Petroleum Co., 19; Cities Service Oil Co., 1,113; Continental Oil Co., 224; Crown Central Petroleum Co., 22; Gulf Oil Co., 1,572; Hartol Products, 45; Pan American, 1,297; Petrol Corp., 474; Petroleum Heat & Power Co., 35; Pure Oil Co., 211; Shell Oil Co., Inc., 904; Sinclair Refining Co., 2,252; Socony-Vacuum Oil Co., Inc., 2,459; Standard Oil of Kentucky, 59; Standard Oil of New Jersey, 4,711; Standard Oil of Ohio, 45; Sun Oil Co., 1,618; Texas Co., 1,865; and Tide Water Associated Oil Co., 515.

The seven companies that participated in the northwest movement reported loading 507 cars during the week, compared with 922 cars during the week of May 16.

Allowing for empty cars to return to California, it is estimated that 1,300 cars are engaged now in the Pacific Northwest service.

Northwest shipments were: General Petroleum, 32 cars; Richfield, 37; Shell, 99; Standard of California, 181; Texas Co., 11; Tide Water Associated 108; and Union Oil Co., 39.

Oil Companies Study Terms Of ODT Truck Restrictions

Regional conferences were held last week to discuss operating methods which should be adopted for meeting the requirements of the order of the Office of Defense Transportation restricting the use of trucks.

J. L. Burke, traffic manager, Stanolind Pipe Line Co., called a meeting in Tulsa at which he presided as chairman of Shippers Oil Field Traffic Association. Plans were considered for pooling the equipment of oil field haulers. W. H. Esser, state chairman of the ODT advisory committee of private carriers, warned truckers at an earlier meeting that pooling is necessary because "when your equipment is gone, you are out of business. There will be no more." Another similar meeting was held at Houston, Tex.

Much clarification appears to be required for applying the rules to the special conditions existing in oil-field operations. The principal feature of the restrictions is that trucks in most types of service must be loaded 100 per cent when traveling one way and loaded 75 per cent on the return trip. Exceptions are made regarding return trip requirements for carriers operating in an active stream of traffic. Restrictions do not apply in the same way to trucks operating within a radius of 25 miles of a center.

The order classifies truck service in four categories: common carriers, contractors, private operators, and local delivery. Some relief has been afforded especially to oil companies through a recent amendment which exempts trucks engaged in repair and servicing of equipment. This exemption is believed to have a broad application. On Page 68 of this issue the application of ODT restrictions to pipe-line operations is discussed. Trucks hauling machinery are exempt. Oil-producing organizations are particularly troubled with the status of lease trucks which appear to require special exemptions which have not yet been made to permit them to perform their normal functions.

Socony-Vacuum Calls for Transportation-Cost Relief

NEW YORK.—Unrecovered excess overland transportation costs incurred by Socony-Vacuum Oil Co., Inc., during April amounted to about $2,300,000, it was disclosed here last week by John A. Brown, president of the company, in an outline of oil industry operating conditions sketched for stockholders at the annual meeting May 28.

"It is our opinion," declared Mr. Brown, "that the Government should currently provide for case reimbursement of such special programs as the railway tank-car movement, undertaken at Government request, and that price ceiling changes should afford an opportunity to recover other higher unit costs, resulting from such things as rationing, for example." Earnings have been declining sharply from January through May, Mr. Brown told the shareholders.

"In the month of April," Mr. Brown said, "the domestic earnings before taxes were approximately half what they were a year ago and about half of the earnings for March of this year. This sharp decline is the reverse of what we would normally expect and it results in large degree from the fact that in April this year the sum of unrecovered excess overland transportation, excess marine transportation and excess product cost all incurred by this company as a result of operating as desired by the Government amounted to about $2,300,000. We cite the figures for April as we naturally have a better estimate for that month than we have for May. The movement of products east at high cost must go on and must be increased, if possible, but surely no one will disagree with our opinion that this service cannot be carried on at such heavy loss by industry.

"It is impossible at this time to give any figure for foreign earnings," Mr. Brown continued, "but we have tried to estimate our domestic earnings for the first 5 months of this year and arrive at a figure of about $15,000,000 before taxes as compared with $13,200,000 before taxes for the same period last year. Comparison of net earnings after taxes cannot be made until the new tax bill is passed."

OPA Creates Field Offices To Handle Oil-Price Details

WASHINGTON, D. C.—The Petroleum Branch, Fuel Division, Office of Price Administration, is appointing representatives in OPA regional and district offices under a policy of having the industry take up price problems with officials in the field as far as possible. To date nine field representatives have been named, as follows:

Philadelphia: Charles E. Boyer, 824 New Broad Street Station Building, Sixteenth and Pennsylvania Boulevard.

Boston: G. Richard Duffy, 17 Court Street.

San Francisco: Hartwick E. Johnston, 1355 Market Street.

Cleveland: Orville D. Judd, 363 Union Commerce Building.

Chicago: Charles M. Linthicum, 2301 Civic Opera Building, 20 North Wacker Drive.

Atlanta: Louis L. Niedrach, Candler Building, Peachtree Street.

New York: Daniel J. Shanahan, Empire State Building.

Los Angeles: Jack N. Westsmith, 1031 South Broadway.

Middle West Drivers Lower Mileage About 20 Per Cent

CHICAGO, Ill.—Automobile drivers in the Middle West reduced their mileage about 20 per cent in April compared with a year ago, it is disclosed in an analysis recently completed by the marketing committee of District 2.

"We have just completed analyses of civilian use of gasoline in the Middle West for April 1942," declared B. L. Majewski, District 2 marketing chairman for the petroleum industry committee, "and the results prove conclusively that the people in this area are conserving rubber for the war effort. The figures reveal that the average automobilist reduced his mileage by 20 per cent compared with April 1941 and spot check for the first half of May indicates that May will reveal a mileage reduction of at least 25 per cent.

"The automobile owners in this area realize that when tires now on their cars wear out, replacements may not be available; as a consequence, they have reduced and will continue to reduce mileage, are driving at greatly reduced speeds and are taking excellent care of tires.

"The public, knowing that ample supplies of gasoline are available in this area, express great concern about the delay on the part of responsible government agencies in Washington in vigorously collecting and reclaiming waste rubber. Reclamation can be accomplished with a minimum drain on critical materials.

"It is our studied opinion that before gasoline rationing is extended to the Middle West, government agencies should devote their energies to the continued encouragement of the proper use of tires instead of denying the use of gasoline in areas where that product is abundant."

Machinery Set Up to Handle Freight on Priority Basis

WASHINGTON, D. C.—Formation of a Transportation Committee to obtain information from the various divisions of the War Production Board as to anticipated transportation requirements and to make recommendations with respect to preferential movement of traffic, within the United States was formed last week by J. S. Knowlson, director of industry operations.

Chairman of the committee is E. B. Stern, of New Orleans, La., who since last October has been OPM and WPB representative to the Board of Economic Warfare. Mr. Stern will devote full time to the committee, whose other members represent interested divisions and branches of WPB. They are Dr. Reavis Cox, division of civilian supply; H. W. Dodge, materials division; Dr. William Y. Elliott, stockpile and shipping branch, and John J. Fennelly, division of industry operations.

Mr. Stern was formerly president of the New Orleans Cotton Exchange, and director of the Atlanta Federal Reserve Bank. He was a member of the firm of Lehman, Stern & Co., New Orleans cotton merchants.

Recommendations of the committee will be submitted to the director of industry operations, who may transmit them in the form of certifications, instructions and directives concerning preferential movement of materials to the Office of Defense Transportation.

When transportation facilities are inadequate to move all freight ready to be shipped between certain points within a definite period of time, the transportation committee will determine on the basis of information obtained from various divisions of WPB which types of freight should be given preference, and will so inform the director of industry operations. The director will then transmit the recommendations to the ODT for appropriate action.

Functions of the Transportation Committee are as follows:

The chairman of the Transportation Committee, with the advice and assistance of the committee, shall:

Obtain from appropriate divisions of the WPB estimates of probable transportation requirements and, after correlation, advise the ODT of these estimates in order that plans may be formulated to handle such requirements.

Make recommendations to the director of industry operations concerning the issuance of certifications, instructions, and directives covering preferential movement of such materials as conditions require; or, in the event of actual or anticipated acute transportation shortages, recommend programs for the curtailment or elimination of transportation for certain traffic not considered essential to the war effort.

CONDENSED DIRECTORY OF THE OFFICE OF PETROLEUM COORDINATOR

Interior Department (New Building) 18th and C Sts., N.W. Phone Republic 1820

Coordinator.—Harold L. Ickes, room 6156, extension 500.

Deputy Coordinator.—Ralph K. Davies, room 6654, extension 3831-2.

Assistant Deputy Coordinator.—Robert E. Allen, room 6645, extension 3334.

Production Division.—D. R. Knowlton, director, room 6070, extension 4861.

Refining Division.—Wright W. Gary, director, room 6637, extension 3233.

Transportation Division.—J. R. Parten, director, room 6629, extension 3557.

Research and Planning Division.—Edward B. Swanson, director, room 7315, extension 649.

Conservation Division.—Everett L. De Golyer, director, room 7516, extension 4459.

Materials Division.—William F. Huff, director, room 7314, extension 4585.

Petroleum Supply Division.—Robert L. Minckler, director, room 4448, extension 4834.

Legal Division.—J. Howard Marshall, chief counsel, room 6649, extension 4100.

Marketing Division.—John W. Frey, director, room 6623, extension 4646.

War Production Board Consultant on Priorities.—O. A. Davis, acting chief, room 7340, extension 4616.

Executive Officer.—Stanley W. Crosthwait, room 6415, extension 4363.

Information Division.—Herbert A. Yocom, director, room 7513, extension 3844.

Foreign Division.—James T. Duce, director, room 7446, extension 4788.

Liaison.—Brig. Gen. Walter B. Pyron, liaison agent between War Department and OPC. Phone Republic 6700, extension 6044, room 6261, new War Dept. Bldg.

Tanker Coordinating Board.—Ralph K. Davies, chairman, room 6654, extension 3831-2.

Receptionist.—Mrs. Rosalie E. Reid, room 6635, extension 3429.

DISTRICT OPC OFFICES

DISTRICT 1
122 East Forty-second St., Chanin Bldg., New York City

DISTRICT 2
120 South La Salle St. Bldg., Chicago, Ill.

DISTRICT 3
245 Mellie Esperson Bldg., Houston, Tex.

DISTRICT 4
817 Seventeenth St., United States Natl. Bank Bldg., Denver, Colo.

DISTRICT 5
417 S. Hill St., 855 Subway Terminal Bldg., Los Angeles, Calif.

WAR PRODUCTION BOARD

Social Security Building, Fourth and Independence Ave., S.W. Phone Republic 7500

Division of Civilian Supply (Temporary Building D).—Leon Henderson, director, room 46, extension 5586.

Petroleum Unit (Temporary Building R).—W. G. Shallcross, business specialist, room 1709, extension 3722.

Bureau of Industry Branches.—Philip D. Reed, director, room 5420, extension 3394.

Petroleum Machinery and Equipment Section (Temporary Building, East, Seventh Wing, Third Floor).—A. E. Collins, chief, extension 5741.

Liaison With Office of the Petroleum Coordinator and Reconstruction Finance Corp.—R. O. McClintock, room 5193-A, extension 71181.

OFFICE OF PRICE ADMINISTRATOR

Temporary Building D

Administrator.—Leon Henderson, room 46, extension 5586.

Assistant Administrator.—George W. Stocking, in charge of fuels.

Fuels Section.—George Doffing, price executive, room 236, extension 5388.

Petroleum Unit.—Joseph Salmon, chief, room 2703, extension 6376.

Director of Gasoline Rationing (Temporary Building S).—Joel Dean, room 1048, extension 71322.

Oil-Field Equipment (La Salle Building).—U. R. Laves, room 3060, extension 5167.

DEATHS

PAUL SCHUCHT, 55, oil driller of Monahans, Tex., dropped dead of a heart attack while engaged in work on a lease near Odessa, Tex. His widow survives.

GUS CARLSON, 59, native of Sweden, who had been employed in the marine departments of the Sabine Transportation Co. and Texas Co., died at Port Arthur, Tex., last week.

OSCAR HILL TRUE, 64, of United Gas Pipe Line Co., died May 28 at Shreveport, La., of coronary thrombosis. Mr. True had been head of United's property tax department since 1931. His widow, a son and a daughter survive.

C. S. STEPHENS, early-day oil man, died at his home in Coffeyville, Kans., on May 25. He had been connected with the oil business since he was 14 years old.

WILLIAM SUMNER BENSON, 78, retired vice president and treasurer of Tide Water Associated Oil Co., died Sunday at his home in Passaic, N. J.

GEORGE W. SHOWALTER, 61, production superintendent for Mid-Continent Petroleum Corp., Tulsa, died suddenly Sunday of a heart attack. He had been with Mid-Continent since 1916, but before that he had been tool dresser, roustabout and pumper for other companies. In 1912 he was field foreman for Prairie Oil Co., resigning in 1915 to go with George Moody, who was then superintendent for Carter Oil Co. at Oilton, Okla. Mr. Showalter is survived by his widow and a son.

OTIS LYMAN JACK, 79, retired oil producer of Bradford, Pa., died at his home in that city last week, after an illness of 3 months. Mr. Jack engaged in the oil business as a drilling contractor and independent producer for many years. His widow and three daughters survive.

BENJAMIN FRANKLIN EGGLESTON, 75, retired oil man of Tulsa, died at his home last Sunday after a lengthy illness. Mr. Eggleston was born in Ohio, but came to Tulsa in 1910. At one time he was president of Eggleston Oil Co., which company he sold in 1921. His widow, a son and a daughter survive.

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OPC Claims Conversion Has Saved 13,500,000 Bbl. of Fuel

WASHINGTON, D. C.—More than 13,500,000 bbl. of heavy fuel oil are being saved annually by East Coast consumers who already have voluntarily converted to coal and other fuels, the office of Petroleum Coordinator Harold L. Ickes announced last week.

This is an increase of 2,700,000 bbl. since May 4, when consumers of heavy fuel had converted facilities burning 10,800,000 bbl. a year. A total of 368 concerns have enlisted, so far, in the program.

Deputy Coordinator Ralph K. Davies estimated that probably another 15,000,000 bbl. a year can ultimately be saved by further conversions.

About 135,000,000 bbl. of heavy fuel oils—Grades 5 and 6 and Bunker C—are normally used annually by East Coast industries, apartment houses, hotels, and other consumers.

Under an order recommended by the Office of Petroleum Coordinator and issued by the War Production Board, effective May 16, deliveries of all grades of fuel oils in the Atlantic seaboard area and in the Pacific Northwest for space or central heating, cooling equipment, and domestic and commercial hot-water supply were curtailed to 50 per cent of normal.

International

Rumanian Production Reported Down to 38.5 Million Barrels

Rumanian oil production, completely under German control, is steadily declining, says European press reports, despite stepped-up quotas set by Germany when the Nazis took over Rumanian economic control. This conclusion is drawn by the U. S. Department of Commerce in its current trade bulletin. Moreover, transportation and storage difficulties are besetting the Germans, though they have solved transport to some extent. The difficulties reduced 1940 output because of storage problems.

Rumania's production, export, and home consumption in the past 3 years are shown in the following table:

(In thousands of barrels)

Years—	Production	Export	Domestic consumption
1939	45,802	30,645	13,102
1940	42,205	25,910	13,579
1941	38,535	22,754	12,478

The insatiable thirst of the German war machine for oil is clearly apparent in the acute oil and gasoline shortage which developed in Rumania during the first quarter of 1942. Stocks that had been accumulated at refineries and in terminals at Constanza have long since been exported to Germany, say press reports originating in Europe.

Regular supplies at certain oil fields are removed daily by Germany, leaving practically nothing for domestic consumption. Taxis and private cars are no longer to be seen in Bucharest, it is stated.

Denmark Blending German Synthetic Rubber With Natural

The Danish rubber industry is adapting itself to the production of rubber substitutes, according to European press reports. Experiments with substitutes derived from limestone and coal have reportedly proved successful, though costs are expected to be high.

At present, Danish manufacturers are mixing the remaining supplies of crude rubber and quantities of German "buna" substitute, and the resulting product is said to have excellent qualities.

Should the production of rubber substitutes be delayed, a joint organization of motor-car owners has offered to undertake a voluntary collection of tires from the 120,000 private motor vehicles which are not now being operated, and to place these tires at the disposal of trucks and regular motor-coach traffic.

Belgium Motor-Car Traffic Reduced 75 Per Cent by War

The motor-fuel shortage in Belgium has converted 15 per cent of the country's motor vehicles to producer-gas operation, say press reports. The remaining 85 per cent are still operating on liquid fuels.

However, a more accurate picture is obtained of Belgium's fuel shortage from figures which show that only 44,797 motor vehicles were operating in the entire country at the end of 1941, of which 20,878 were motor trucks. In 1937 Belgium had 202,000 motor vehicles in operation, including 74,000 motor trucks.

The figures disclose that Belgium's motor traffic declined 75 per cent by the end of 1941. In exact numbers, 6,023 vehicles have been fitted with producer-gas units, it is stated.

Companies Formed to Search Reich Controlled Area for Oil

The unrelenting German search for petroleum is indicated by recent formation of companies in Austria, Hungary, and the old Reich itself, to prospect for land to produce oils, natural gas, butane, propane, and their derivatives, according to the European press.

A new company organized by existing concerns in the field will undertake prospecting and production of oil in the Province of Niederdonau (lower Danube) in Austria, European press reports indicate. The organizing companies already are active in the Rumanian oil industry and have engaged in active exploration in Hungary. Capitalization of the new concern is fixed at 1,000,000 marks.

Additional activity appears in formation of a new company to act as selling and distribution agent for the Propane Syndicate. The company will dispose of butane, propane, and the various mixtures of the two gases—largely for motor fuel, but also for various industrial uses. Among the latter is the manufacture of synthetic rubber.

Total output of both propane and butane has increased rapidly in recent years, it is said, in accordance with expansions in the coal-oil industry. Originally considered byproducts, the two gases have gained great importance in their liquid forms. They are used directly for motor engines, especially for cold-weather starting.

Mexico's Crude Production Suffers Sharp Decline

MEXICO CITY, D. F.—Crude-oil production from properties operated by Petroleos Mexicanos declined in April to 2,702,744 bbl., compared to 3,241,539 bbl. reported in the previous month.

All of the decline was suffered by Poza Rica and North Tampico. Increased production in April was reported from the South Tampico and Isthmus fields. Comparison of production by districts in March and April, as reported by Petroleos Mexicanos, follows:

(Data in barrels)

District—	March	April
North Tampico	378,174	311,626
South Tampico	376,356	503,244
Poza Rica	2,035,840	1,450,587
Isthmus fields	451,169	437,287
Total	3,241,539	2,702,744

Total production for March and April, last year, including 4,500 to 5,000 bbl. daily recovered by independent operators not affected by expropriation was 2,887,272 and 3,434,241 bbl., respectively. Figures in the table above do not include production by independent unexpropriated companies.

Switzerland to Produce Synthetic Rubber at Zurich

Artificial rubber will be produced near Zurich, Switzerland, according to the U. S. Department of Commerce bulletin.

Charcoal or byproducts of gas manufacture will provide the raw materials. The practicability of the new synthetic is said to have been demonstrated in tests with bicycle tires and insulation materials, which show that the Swiss product is impervious to oil and gasoline and has insulating properties superior to those of natural rubber.

There has been no statement as to whether tests have been made to determine if it may be used for automobile and truck tires.

Cuba Restricts Gasoline by Limiting Station Service

Gasoline stations in Cuba will serve only the following classes of vehicles up to noon of each day: Public service vehicles, taxis, industrial, commercial, and agricultural vehicles. Private and official cars can only be service after noon.

Stations are to serve only their regular customers, and Habana doctors are allotted a special station which is to be used exclusively by them. They may use no other station.

The only government cars excepted from withdrawal and storage are those of cabinet ministers, subsecretaries of such ministers, foreign diplomatic and consular corps, hospital and other sanitary services, and chief engineers of each province.

France Swinging Away From Petroleum Fuels

To fill its fuel needs, France will henceforth depend less on motor fuels derived from petroleum and coal than on those processed from substitute sources, European press reports indicate. Particularly stressed are developments of alcohol, shale oil, and generator gas from wood.

A whale-oil refinery is raising daily outputs to a figure which increases French synthetic output 50 per cent; further additions are planned. Other plants are being constructed for using lignite deposits, and 50,000 tons of motor fuel are expected from them by 1945.

Generator-gas production is also undergoing expansion—50 plants beginning charcoal production, with another 50 to follow within 2 years. Output of charcoal, 30,000 metric tons in 1941, will be increased to 150,000 tons in 1942, and is expected to reach 350,000 tons ultimately. Obtaining wood and transporting it may cause difficulties, however.

Power-alcohol production is also to be increased, but indications are that quantities will not be available until 1943, when production is to be increased 20 per cent.

Increased supplies of motor fuel cannot be foreseen this year, and French oil consumers are forced to economize, but some relief is expected from large use of gas-generator vehicles.

Natural Gasoline

Isobutane Production Reflects Higher Demand As Valuable Base Component of War Materials

DAILY average production of isobutane increased to 331,000 gal., in March at natural-gasoline plants and in condensate-recovery operations, according to statistics of the Bureau of Mines released last week.

The opposite trend was reported for the production of natural gasoline which declined to a daily average of 226,000 bbl. in March compared to 242,000 bbl. daily in February. Production of natural gasoline during the first 3 months of this year, reported by the Bureau of Mines at 236,000 bbl. daily, is substantially higher than the average of 160,000 bbl. daily for the same quarter last year.

Production of liquefied petroleum gas at natural-gasoline and distillate recovery plants declined to 1,664,000 gal. in March, compared with 1,842,000 gal. in February. Output of liquefied refinery gas decreased from 6,300,000 gal. in February to 5,922,000 gal. in March.

The most significant decreases in production of natural gasoline occurred in East Texas, Kettleman Hills, California and Louisiana.

NATURAL-GASOLINE PRODUCTION

(Thousands of gallons)

	Mar. 1942	Feb. 1942	Jan.-Mar. 1942	Jan.-Mar. 1941
Appalachian	10,700	11,146	34,083	26,911
East Ohio	733	761	2,380	2,232
Other	9,967	10,385	31,703	24,679
Ill., Mich., Ky.	12,320	11,436	36,059	14,323
Oklahoma	37,958	35,047	110,945	91,626
Oklahoma City	5,230	5,957	17,901	18,413
Seminole	12,581	11,590	36,297	25,582
Rest of state	20,147	17,500	56,747	47,631
Kansas	7,187	7,080	21,917	19,821
Texas	137,517	132,494	417,948	250,183
Gulf	34,800	32,757	102,970	60,053
East Texas	22,685	24,079	73,227	37,300
Panhandle	36,453	33,894	110,645	68,516
Rest of state	43,579	41,764	131,106	84,314
Louisiana	24,074	24,504	76,239	28,423
Gulf	5,462	4,887	15,838	(*)
Inland	18,612	19,617	60,401	(*)
Arkansas	3,526	2,727	9,163	8,328
Rocky Mountain	10,835	9,733	31,323	22,830
New Mexico	7,322	6,575	21,026	13,046
Other	3,513	3,158	10,297	9,784
California	50,723	50,089	155,915	140,885
Kettleman Hills	10,073	11,446	34,377	29,118
Long Beach	7,476	6,809	21,888	21,692
Ventura Avenue	5,333	5,141	16,194	14,448
Rest of state	27,841	26,693	83,456	75,627
Total	294,840	284,256	893,592	603,330
Daily average	9,511	10,152	9,929	6,704
Total (thou. bbl.)	7,020	6,768	21,276	14,365
Daily average	226	242	236	160

*Not available.

PRODUCTION AND DISTRIBUTION OF LIGHT PRODUCTS IN THE UNITED STATES

(Thousands of gallons)

	1942 Mar.	1942 Feb.
Stocks first of month	225,078	207,060
Production:		
Natural gasoline	173,082	168,840
Cycle products	59,346	54,684
Liquefied petroleum gas:		
Isobutane at natural gasoline and cycle plants	10,248	9,156
L.P.G. at natural gasoline and cycle plants	52,164	51,576
Liquefied refinery gas at refineries	9,660	10,248
Total supply	529,578	501,564
Stocks end of month:		
Natural gasoline	206,892	193,368
Cycle products	14,826	13,062
Liquefied petroleum gas:		
L.P.G.	14,322	12,348
L.R.G.	5,922	6,300
Total stocks	241,962	225,078
Demand:		
Used at refineries	185,388	187,152
Natural gasoline and cycle condensate to jobbers and retail outlets	42,882	32,382
Liquefied petroleum gas to jobbers and retail outlets	33,390	33,558
Exports and losses	25,956	23,394
Total demand	287,616	276,486

Humble Gives Recognition to 41 Employes For Conducting Gasoline-Plant Course

NEW LONDON, Tex.—Forty-one employes at the East Texas gasoline plants of Humble Oil & Refining Co. were awarded certificates by the company in recognition of the work they have done in conducting a conference course in gasoline-plant operation. The certificates were presented by J. O. Sue of Houston, Tex., superintendent of the natural gas and gasoline department, at a barbecue supper that was given at the Recreation Hall at New London on May 23, 1942.

The primary purpose of the course was to familiarize the employes with the smallest detail of operation of modern plant equipment. Participation in the endeavor was strictly voluntary on the part of all concerned, yet every man took advantage of the opportunity to learn more about his plant. Every plant operator received a certificate.

The course was planned by the plant superintendents in collaboration with the other personnel of the plants. It was a seminar type course, in which the men on each shift worked together as a group to prepare and present the subject matter for the meetings.

The plants were studied by considering a division at a time; first the gas system, next the water system, then oil, gasoline, steam, and air. An essential part of the preparation for leadership of a meeting was the drawing of a flow sheet of the part of the plant that was being studied. Each group of men made a flow sheet of the various systems of piping in the plants, so that every man would be assured of knowing the location and the purpose of every important and remote line, valve, and regulator in the plant.

Humble Oil & Refining Company

HUMBLE

This Certificate has been awarded to

John K. Carroll

of the American Gasoline Plant

for his laboratory and efficient contribution to the course in

Gasoline Plant Operations

planned and conducted by him and his fellow employees

Given this 1st day of November 1941

The men met in the plant office once a week to discuss the particular part of the plant that had been studied that week. One member of the group that had prepared the lesson for that week would lead the class, and all the men present joined in the discussion. In addition to problems of operation, the men frequently discussed the safest and most practical way of handling hypothetical accidents or blowouts.

The service men talked to each plant group about the care and operation of plant machinery and equipment. The electrician gave lectures, with drawings to clarify his talk, on the safe operation of electrical and emergency shutdown equipment. The mechanical supervisor and the repairmen at each plant gave lectures on the correct methods of maintaining and operating vital machinery in the plants. The meter men made sketches of the field lines, showing all block valves and jump-overs on vacuum, residue, and gas-lift lines, and gave a lecture on the operation and significance of the various features of the field system.

Natural Gas

Natural-Gas Sales Increase 11.3 Per Cent, A.G.A. Reports

Sales of natural gas in February increased to 174,388,500,000 cu. ft., a gain of 11.3 per cent over the same month in 1941, the American Gas Association reported last week on the basis of returns from a majority of the nation's utility companies. A.G.A. figures show that gas sales during the frist 2 months of this year increased 14.4 per cent over a year ago.

Distribution to commercial consumers in February increased 14.8 per cent to lead other classes of demand. Gas consumed in generation of electrical energy increased 17.7 per cent.

Industrial demand increased nearly 9 per cent and totaled 74,382,500,000 cu. ft. in February. Domestic consumption gained 10.3 per cent.

Federal Power Board to Hear Interstate Case at Baton Rouge

BATON ROUGE, La.—A public hearing will be held here June 15 by the Federal Power Commission on the rates of the Interstate Natural Gas Co., Inc., covering a consolidation of Dockets G-132 and G-149. The Louisiana Public Service Commission has complained that Interstate's gas rates and transportation charges are unjust and unreasonable.

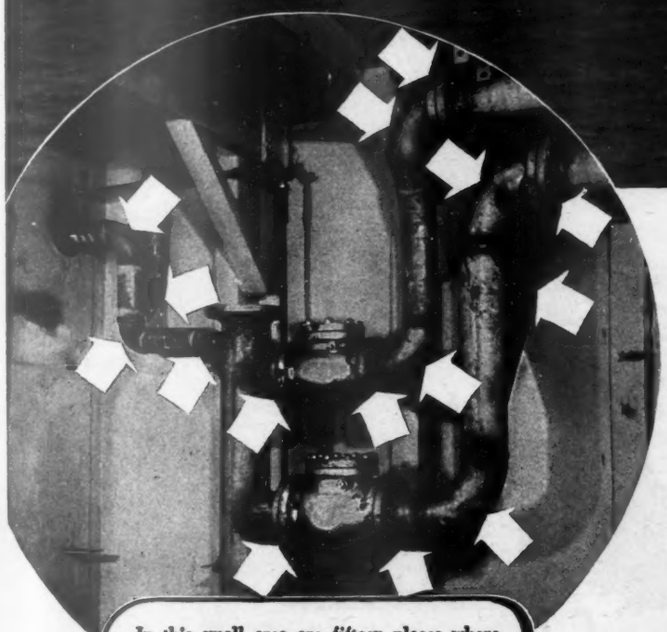
The investigations, instituted by the FPC, is to determine whether the Interstate company is subject to provisions of the Natural Gas Act, whether its rates and charges are unjust.

The city of New Orleans has been granted permission to intervene in the proceedings.

Senate Recommends Spending $4,000,000 on Helium Program

WASHINGTON, D. C. — Expenditure of $4,000,000 for construction and equipment of helium plants has been recommended by the Senate appropriations committee. Construction and operation probably would be assigned to the Bureau of Mines which is now engaged in producing helium gas for lighter-than-air craft in the Texas Panhandle.

There are no "spills" at piping turns when TUBE-TURN fittings are on the job!



In this small area are *fifteen* places where Tube-Turn welding fittings and flanges are on the job—giving full protection against leakage and other maintenance worries. In any complete piping system, figure the hundreds of points where flow direction changes, and you'll see why Tube-Turn returns, elbows, tees, reducers, laterals, nipples, caps and flanges offer extra protection and trouble-free piping.

Disaster at the turns is an old story—

With spray flying and motors roaring, speed boats hurtle around the buoy-marked racing turns at break-neck speed! Cutting the curves too sharp or too fast means an upset—another case of failure at the turns.

The same danger lies at turns in *piping systems*. Wherever there is a change in flow direction, the strain imposed by the flow speed and pressure increases the probability of leakage and failure unless they're *welded* and *protected* with Tube-Turn welding fittings!

Write for helpful Tube-Turn data book and catalog.

TUBE-TURNS, INC., Louisville, Ky. *Branch offices:* New York, Chicago, Philadelphia, Pittsburgh, Cleveland, Tulsa, Houston, Los Angeles. *Distributors in all principal cities.*

TUBE-TURN TRADE MARK — The FIRST WELDING FITTINGS 1ST AND STILL THE BEST — *Welding Fittings*

a "T" WELL CROSSED

THIS is the husky, case-hardened piston pin of the Type G-MV Compressor . . . bolted T-style to its saddle-end connecting rod. This same T-type construction is followed on both ends of the rod, and every pin floats in a full-length, bronze bearing.

The *extra* bearing-surface of these patented T-type bearings is *extra* assurance of long, trouble-free performance under heavy loads and constant service. It typifies the strength and wear-resistance built into every part of every C-B Compressor.

It's this special attention to engineering and construction details that is keeping thousands of Cooper-Bessemer compressors "on the line" in 24-hour heavy-duty service throughout America's war industries!

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by Cooper-Bessemer

ENGINE BUILDERS SINCE 1833

ENGINEERING *and Operating* SECTION

▼

Application of Back-Pressure Tests to Gathering Systems

By J. WILLIAM FERGUSON* and MILTON F. SHAFFER†

One of the questions which must be answered when designing and operating a gas system is the volume each well feeding into main trunk can deliver against a given range of pressures. In this paper the authors develop a graphical method of solving this problem which will be welcomed by engineers working in gas production, recycling and repressuring.

A short biography of the authors appears in Journalisms, on Page 108 of this issue.

FREQUENTLY it is desired to know how much gas the wells feeding into a gathering system can deliver against a range of pressures at the outlet of the gathering system. The purpose of this paper is to set forth a graphical method of determining the answers to these problems.

A minor deviation from accepted procedure for back-pressure tests is recommended for this one purpose only. That is, where the ordinary delivery curve is plotted at bottom-hole conditions, we are using a curve in which the delivery is plotted against the differences between the squares of the absolute rock pressure and the absolute working pressure, both of which are observed at the top of the well. This results in a curve controlled by the well-head conditions, which is necessary if pipe-line pressures are to be considered in connection with well pressures.

Since this discussion is to be confined to the description of a mechanical procedure and no mathematical considerations are involved it is well to set up an assumed layout of wells and pipe lines such as might possibly be encountered in actual practice, and show the method of attack for this specific case.

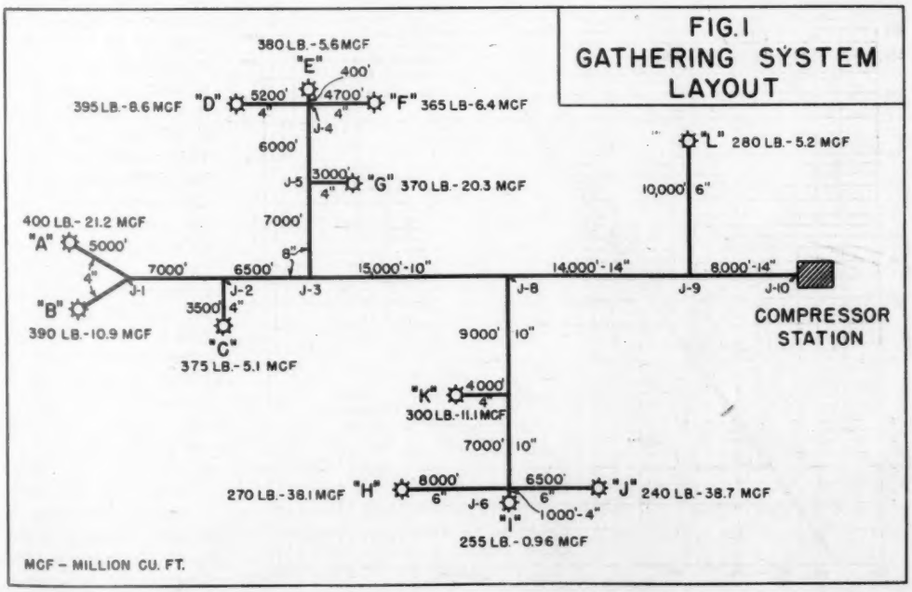
Fig. 1 is such a system of wells and pipe lines. It does not represent an ideal setup by any means, but could represent a system which just grew into being without too much prior planning.

It will be noted that there is a considerable spread in rock pressures, from a top of 400 lb. per sq. in. abs. to a minimum of 240 lb. per sq. in. abs. This was done on purpose to disclose the peculiar results obtained as the various low-pressure wells cease flowing because of high line pressures. Of course, it must be assumed that the wells are all equipped with check valves to prevent back flow.

1. Associate natural gas engineer, U. S. Bureau of Mines, Cryogenic Laboratory, Amarillo, Tex.

†Gas engineer, Hagy, Harrington & Marsh, Amarillo, Tex.

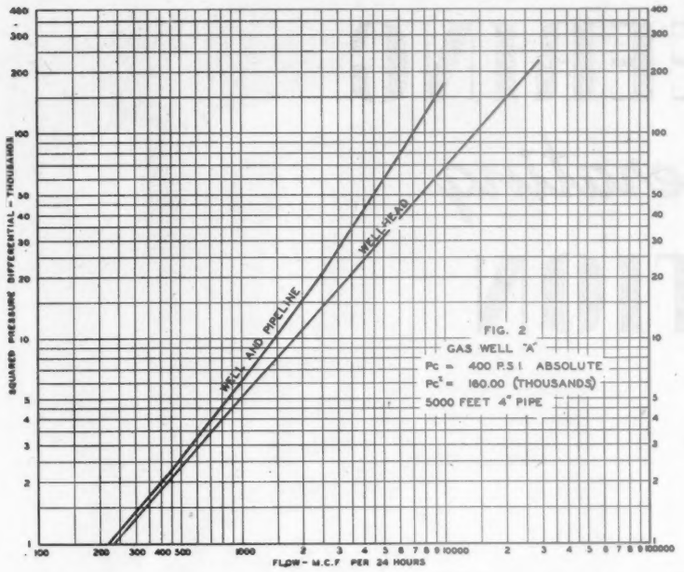
FIG. 1 GATHERING SYSTEM LAYOUT

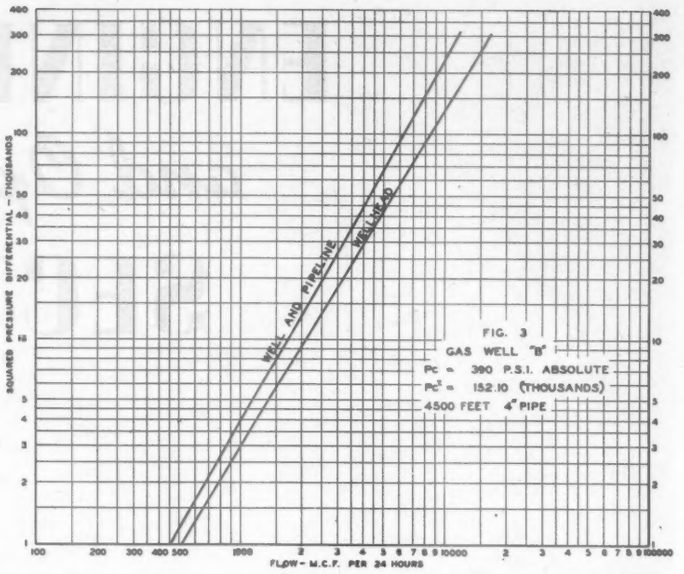


Well Head Delivery Curves

The lower curves in Figs. 2, 3, and 4 show respectively the well-head delivery curves for the gas wells *A*, *B*, and *C*. The flow rates in these figures, as in all subsequent well and pipe-line curves, are expressed in cubic feet at 16.4-lb. pressure base and 60° F. The upper curves in each of these figures are the result of adding to the squared pressure differentials producing the flow from the well, the squared pressure differentials in the lateral pipe line connected to the well at each flow rate. The squared pressure differentials for pipe-line flow may be obtained in a number of different ways, but one of the simplest of these to use is shown in Fig. 5.

The curves on Fig. 5 were drawn from Weymouth's formula for pipe-line flow, and, for a given flow rate, show the difference between the squares of the inlet and outlet pressures for the





length and size of pipe marked on each curve. The curves are based on cubic feet of gas at 16.4-lb. pressure base, 60° F. base and flowing temperature, and specific gravity of 0.70, which is the specific gravity of all of the wells considered in this study. They possess several advantages which might not appear at first glance. For a length of pipe different from that shown on a particular curve, the squared pressure differential should be multiplied by the ratio of the actual length to the length shown on the curve. For a specific gravity other than 0.70, multiply the differential by the gravity and divide by 0.70. If the volume of gas flowing exceeds the upper range of the curve, simply by multiplying the horizontal scale by 10 and the vertical scale by 100 one may continue the usefulness of the curve. Similarly, if the given quantity is below the lower limit of the curve, one may divide the horizontal scale by 10 and the vertical scale by 100 to cover this case.

Example of Adaptations

A specific example may help to show these adaptations. Suppose we have 60,000 M.c.f.* or 0.65 specific gravity gas flowing through 3,000 ft. of 8-in. pipe. The squared pressure differential for 60,000 M.c.f. of 0.70 specific gravity gas flowing through 10,000 ft. of 8-in. pipe exceeds 100,000, so we find that a flow of 6,000 M.c.f. results in a differential of 2,010. Then a flow of 60,000 M.c.f. results in a differential 100 times as much, or 201,000. The length being only 3,000 ft. instead of 10,000 ft., we multiply 201,000 by 0.3, to get 60,300. And since the specific gravity of the gas is 0.65, we multiply 60,300 by 0.65 and divide by 0.70 to get approximately 56,000. These results are all correct to slide-rule accuracy.

To return to the upper curves shown in Figs. 2, 3, and 4: These were constructed by selecting a number of different flow rates and obtaining the corresponding pipe-line squared pressure differential for the lateral connected to each well. This pipe-line differential was then added to the well differential to give a curve such that for a given flow, the squared pressure at the end of the lateral is immediately available. For example, in Fig. 2, for well "*A*," a flow of 3,500 M.c.f. requires a differential of 21,000 between the square of the rock pressure (P_c^2) and the square of the working pressure (P_w^2). For this amount of gas to flow through the 5,000 ft. of 4-in. pipe-line lateral, a differential of 13,200 must be established between the squares of the working pressure at the well and the pressure at the end of the 4-in. lateral. Consequently, a differential of 34,200 must be set up between the squares of the rock pressure and the pressure at the end of the lateral. For this well, having a rock pressure of 400 lb. per sq. in. abs., the square of which is 160,000, to produce 3,500 M.c.f. per day through 5,000 ft. of 4-in., the square of the pressure at the end of the 4-in. must not exceed 125,800, which is 160,000 minus 34,200. Then, the pressure at the end of the 4-in. must not exceed 354.7 lb. per sq. in abs.

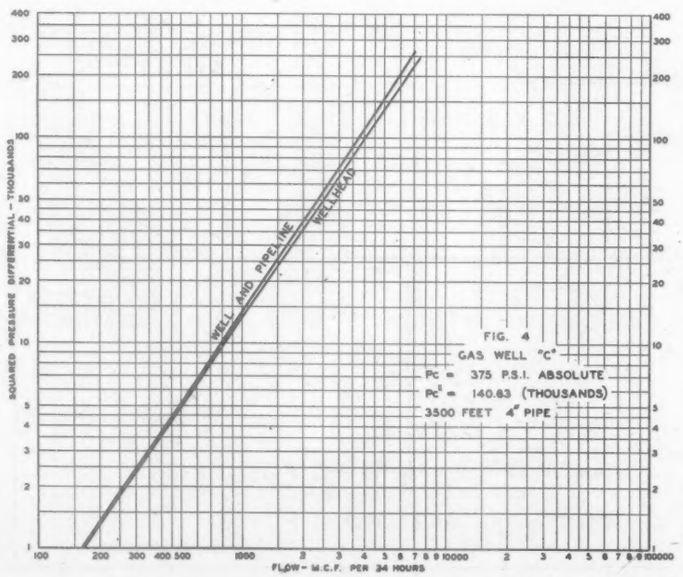
It will be noted that there is a definite curvature in the curve for well and pipe line. This results from the fact that the slope of the well curve is not the same as the slope of the pipe-line curve. Enough points should be chosen to define this curvature sufficiently that a smooth curve may be drawn.

The construction of a well-and-pipe-line curve for each well and its lateral is the first step in the problem. The curves included here are only for wells "*A*," "*B*," and "*C*," but a curve was constructed for each of the other wells.

We come now to the consideration of tying a group of wells together to get a composite curve of wells and pipe lines. Let us first take wells "*A*," "*B*," and "*C*," and all of the pipe lines connected to them, as well as the 8-in. trunk line to the point designated as *J*-3. We shall refer to this as "System 1."

We shall attack the problem by assigning a value to the pressure at the point *J*-1, which will, of course, determine the amount of gas which will flow from wells "*A*" and "*B*." We then will determine the squared pressure drop in the 7,000 ft. of 8-in. pipe to *J*-2. Deducing this from the square of the pressure at *J*-1 gives us the square of the pressure at *J*-2, which, in turn gives us the quantity of gas which will flow from well "*C*." From the squared pressure at *J*-2 we will deduct the squared pressure differential in the 6,500 ft. of 8-in. pipe to *J*-3, thus obtaining the square of the pressure at *J*-3, corresponding to the quantity of gas obtained from the three wells under the given conditions. By assigning various values to the pressure at *J*-1, we get a range of corresponding values of pressures and quantities at *J*-3.

For example: Assume a pressure at *J*-1 of 333.17 lb. per sq. in. abs. 333.17 lb. per sq. in. abs. squared is 111.00 (thousands). For well "*A*," $P_c^2 = 160.00$ (thousands); 160.00 — 111.00 = 49.00; for a differential of 49.00, from Fig. 2, well "*A*" can produce at the rate of 4,420 M.c.f. per day. For well "*B*," $P_c^2 = 152.10$ (thousands); 152.10 — 111.00 = 41.10; for a differential of 41.10, from Fig. 3, well "*B*" can deliver at the rate of 3,820 M.c.f. per day. Consequently, we have a total of 8,240 M.c.f. flowing through 7,000 ft. of 8-in. pipe to *J*-2. This results in a pipe-line differential of 2.67 (thousands), so that the square of the pressure at *J*-2 is 111.0 — 2.67 = 108.33. (The pressure is 329.14 lb. per sq. in. abs.) For well "*C*," $P_c^2 = 140.63$ (thousands); 140.63 — 108.33 = 32.30; for a differential of 32.30, from Fig. 4, well "*C*" can produce at the rate of 1,760 M.c.f. per day. Consequently we have a total of 10,000 M.c.f. flowing through 6,500 ft. of 8-in. pipe to *J*-3. This results in a pipe-



*M.C.F. in Fig. 1 = 1,000,000 cu. ft.

line differential of 3.64 (thousands) so that the square of the pressure at *J*-3 is 108.33 — 3.64 = 104.69 (thousands). The pressure at *J*-3 is then 323.56 with a flow of 10,000 M.c.f. per day.

In a similar manner, we may assume quite a number of other pressures at *J*-1, and follow down to *J*-3 to arrive at a set of values of pressures or squared pressures and their corresponding quantities.

One method of using these sets of values is shown in Fig. 6. In constructing this curve, each value of the squared pressure at *J*-3 was subtracted from 160.00 (thousands) (P_c^2 for well "*A*"), and this differential plotted against its corresponding quantity. In other words, we may consider well "*A*" as the control well for this system.

The sharp breaks in the curve are the result of wells "*B*" and "*C*" beginning to flow as the pressure in the pipe line is lowered. It is obvious that well "*B*" with a rock pressure of 390 lb. per sq. in., cannot feed into the line until the pressure at *J*-1 is below 390 lb. per sq. in.; similarly, the pressure at *J*-2 must be lower than 375 lb. per sq. in. before well "*C*" begins to feed. There is nothing very difficult about determining these breaking points in a given case, but a sufficiently large number of points should be taken to control the composite curve.

Gas Deliveries at Junction

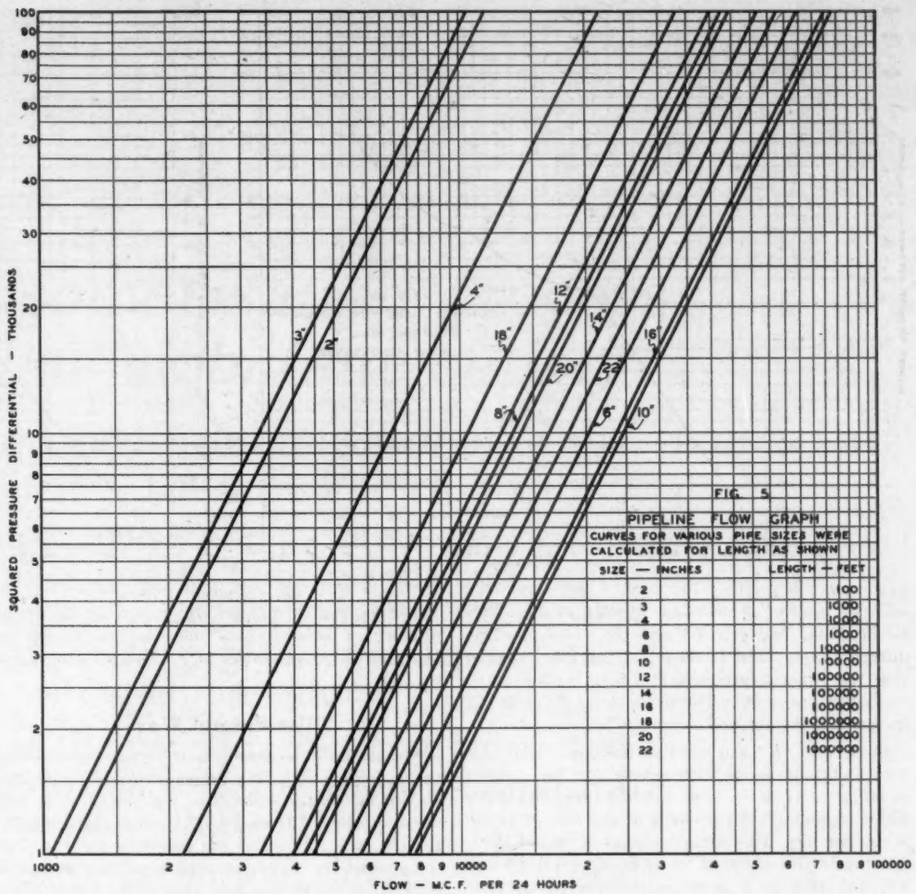
As an example of the possible use of Fig. 6: How much gas could these three wells, "*A*," "*B*," and "*C*" deliver at *J*-3 if the pressure at *J*-3 is 200 lb. per sq. in. abs.? 200 lb. per sq. in. squared is 40.00 (thousands). Then 160.00 (thousands) minus 40.00 is 120.00. From the curve, with a differential of 120.00 (thousands), the quantity shown is 16,700 M.c.f. per day, within slide-rule accuracy.

The same method of accumulation was used in preparing Figs. 7 and 8. Fig. 7 shows the composite curve for wells *D*, *E*, *F*, and *G*, with the pipe lines down to *J*-3. The squared pressures at *J*-3 for this system (which we shall call System 2) were subtracted from 156.03 (thousands), which is P_c^2 for well "*D*."

Fig. 8 shows the composite curve for wells *H*, *I*, *J*, and *K*, with the pipe lines down to *J*-8. This system will be called System 3. The squared pressures at *J*-8 were subtracted from 90.00 (thousands) which is P_c^2 for well "*K*."

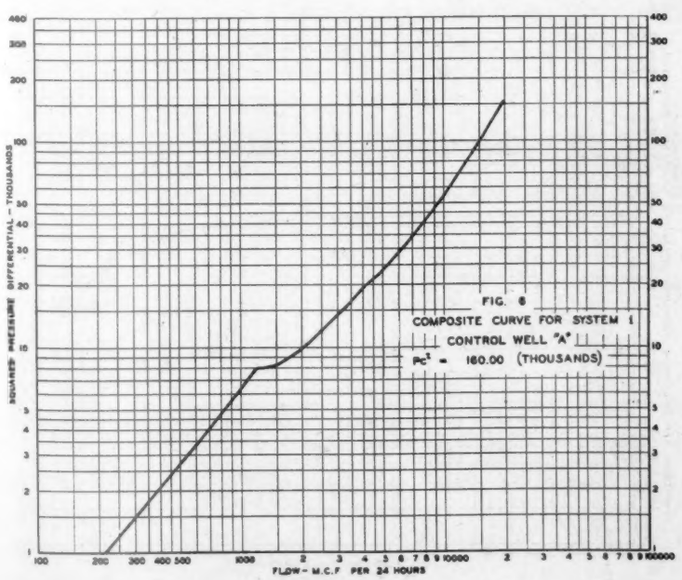
Fig. 9 is the curve for well "*L*" corresponding to Figs. 2, 3, and 4.

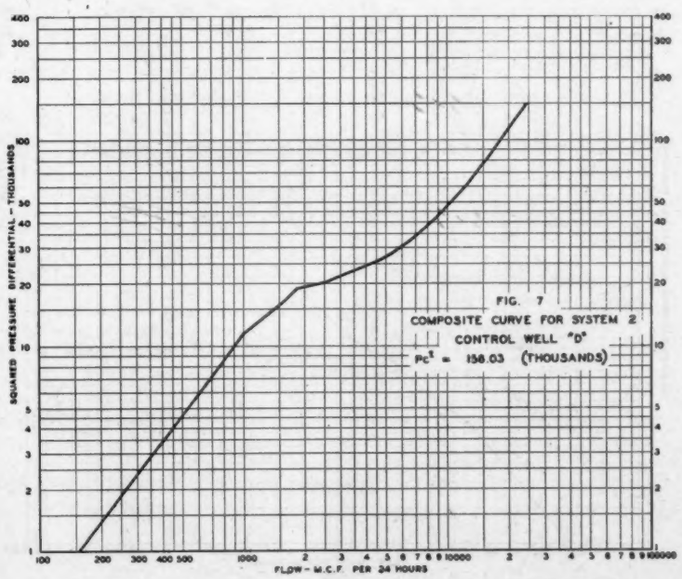
Now, we have arrived at the point where we want to tie all three systems and well "*L*" into a composite curve wherein the pressure at *J*-10 (the compressor station) is the controlling factor.

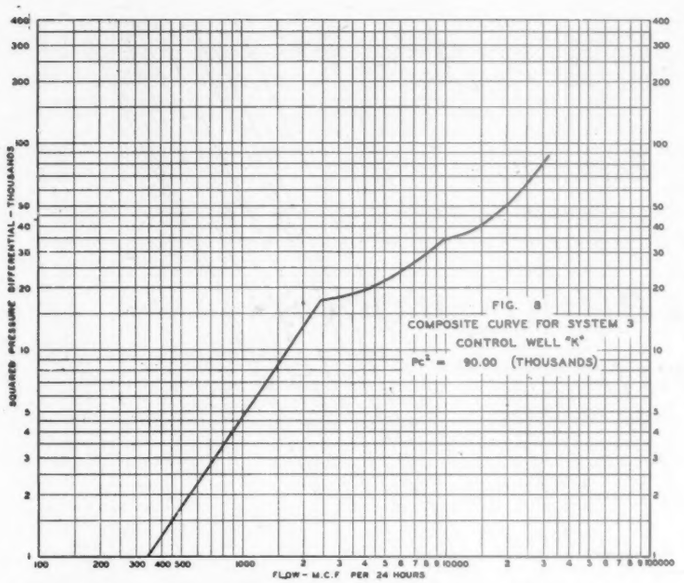


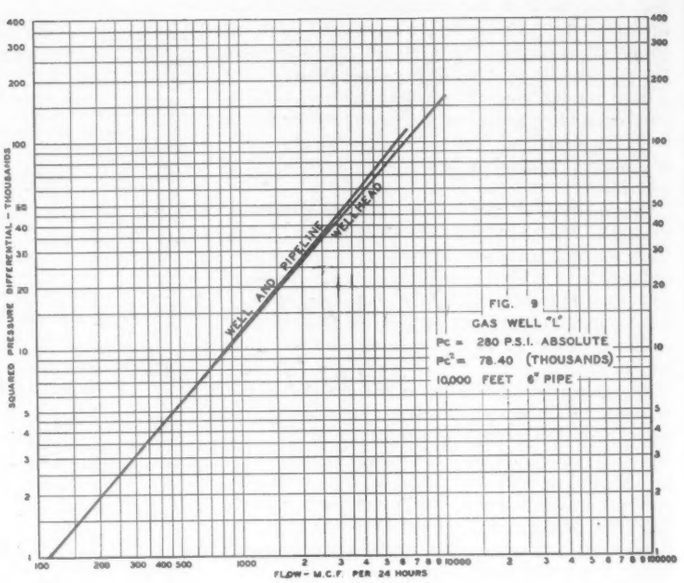
In order to do this, we start with the various values of pressure at *J*-3, determining the amounts of gas which Systems 1 and 2 will produce against those pressures, then the pipe-line differentials created by the various total gas flows to *J*-8; this fixes the values of the squared pressure at *J*-8, and consequently the amounts of gas which System 3 will produce; the pipe-line differentials from *J*-8 to *J*-9 with the total quantities from Systems 1, 2, and 3 will fix the squares of the pressures at *J*-9, and hence the amounts of gas which well "*L*" will produce against those pressures; and finally, the pipe-line differentials for the various total flows from the entire system through the last length of pipe line from *J*-9 to *J*-10 will determine the squares of the pressures at *J*-10.

As an example of this process: Assume a pressure of 264.58 lb. per sq. in. abs. at *J*-3, so the squared pressure is 70.00 (thousands). Since we used well "*A*" as the control on System 1, the squared pressure differential on System 1 is 160.00 — 70.00 = 90.00 (thousands) and from Fig. 6, the quantity which would come from this system is 13,900 M.c.f. per day. Since we used well "*D*" as the control on System 2, the squared pressure differential for this system is 156.03 — 70.00 = 86.03 (thousands), so that from Fig. 7,


SQUARED PRESSURE DIFFERENTIAL - THOUSANDS
FLOW - M.C.F. PER 24 HOURS
FIG. 8
COMPOSITE CURVE FOR SYSTEM 1
CONTROL WELL "A"
Pc² = 160.00 (THOUSANDS)


SQUARED PRESSURE DIFFERENTIAL - THOUSANDS
FLOW - M.C.F. PER 24 HOURS
FIG. 7
COMPOSITE CURVE FOR SYSTEM 2
CONTROL WELL "D"
Pc² = 156.03 (THOUSANDS)


SQUARED PRESSURE DIFFERENTIAL – THOUSANDS
FLOW – M.C.F. PER 24 HOURS
FIG. 8
COMPOSITE CURVE FOR SYSTEM 3
CONTROL WELL "K"
Pc² = 90.00 (THOUSANDS)



System 2 will produce 16,250 M.c.f. per day. This makes a total of 30,150 M.c.f. flowing in the 15,000 ft. of 10-in. between *J*-3 and *J*-8. The pipe-line differential is 22.60 (thousands) for this flow, so that the squared pressure at *J*-8 is 70.00 — 22.60 = 47.40 (thousands). The pressure at *J*-8 is 217.72 lb. per sq. in. abs.

Since well "*K*" was used as the control on System 3, the pressure differential for the system is 90.00 — 47.40 = 42.60 (thousands), and from Fig. 8, System 3 will produce at the rate of 16,100 M.c.f. per day. This makes a total of 46,250 M.c.f. flowing in the 14,000 ft. of 14-in. between *J*-8 and *J*-9, resulting in a pipe-line differential of 11.20 (thousands). Consequently the square of the pressure at *J*-9 is 47.40 — 11.20 = 36.20 (thousands), and the pressure is 190.26 lb. per sq. in. abs. Since well "*L*" has a value of P_c^2 of 78.40 (thousands), the differential on its lateral is 78.40 — 36.20 = 42.20, and the well will produce 2,780 M.c.f. per day; (Fig. 9). This added to the 46,250 M.c.f. up to *J*-9 makes a total of 49,030 M.c.f. flowing into *J*-10; this creates a pipe-line differential of 7.19 (thousands) in the 8,000 ft. of 14-in. pipe, so that the square of the pressure at *J*-10 is 36.20 — 7.19 = 29.01 (thousands), and the pressure at *J*-10 is 170.32 lb. per sq. in. abs.

Thus we have established one point on the composite curve for the total system, that is a flow of 49,030 M.c.f. at a suction pressure at *J*-10 of 170.32 lb. per sq. in. abs. In a similar manner a number of other points may be calculated by using different pressures at *J*-3 and working back to *J*-10.

Use Several Ways

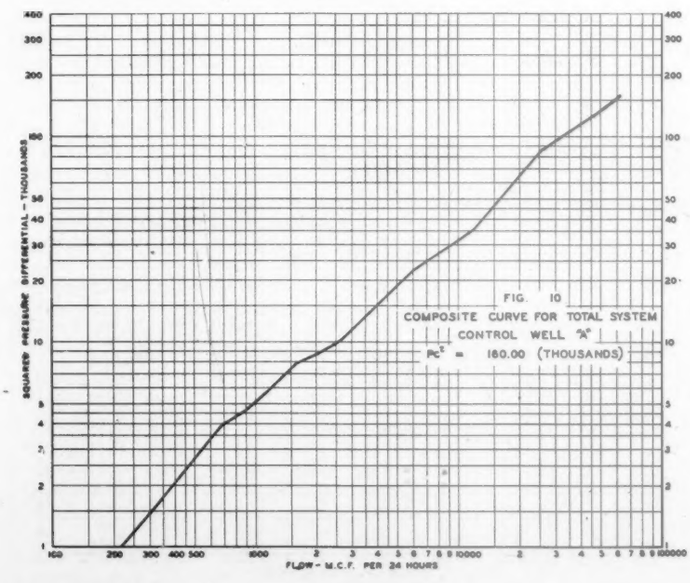
We have a choice as to how to use these points to best advantage. Fig. 10 shows one possibility. In this curve, the squares of the pressures at *J*-10 were subtracted from 160.00 (thousands) (the P_c^2 for the well "*A*"), and the resulting figures plotted against the corresponding quantities. It is evident from inspection that this curve needs more points of control than the curves for Systems 1, 2, and 3, since wells are continually cutting into operation over almost the whole range of the curve from 1.0 (thousand) to about 120.00 (thousands), as evidenced by the kinks in the curve.

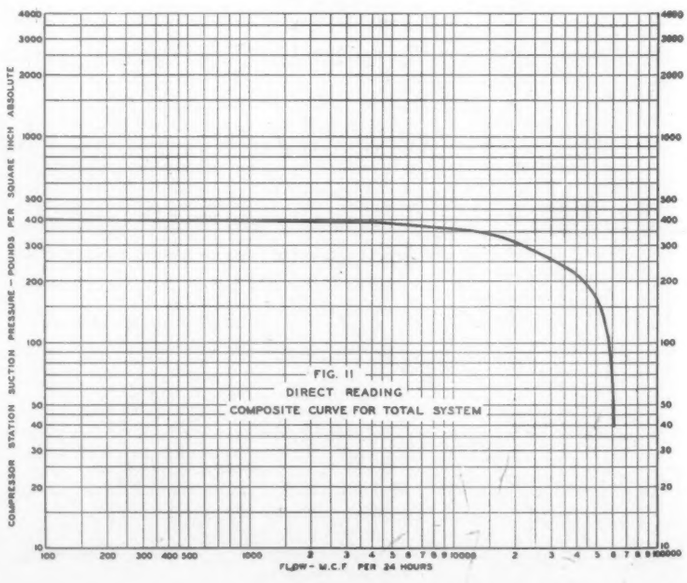
Fig. 11 seems to represent a more straightforward presentation of the results of the calculations. In this curve the quantities are plotted directly against the pressures at the compressor station. This curve has kinks also, but they are less pronounced. Since this curve is direct reading it is probably the more useful of the two. If it is desired to do so, this curve could be plotted using gage pressures at *J*-10 instead of absolute pressures.

Summary

A method for determining graphically a curve to represent the producing ability of a system of wells and gathering lines has been presented. The illustration chose was purposely selected to show the peculiarities arising when there is a wide variation in the rock pressures of a group of wells tied to the same gathering system. Naturally, if the rock pressures were all within a narrow range, any kinks in the composite curve would fall close together, at pipe-line pressures close to the rock pressures of the wells. In this event it is not necessary or even particularly desirable to calculate a great many points for plotting the final curves. Only enough points should be calculated to define the final composite curve.

Note.—If it is desired to limit the amount of gas produced from each well to a percentage of its open flow, or by any other arbitrary procedure, the process for obtaining the composite curve would be identical except that the quantities from a given well would increase with decreasing line pressures until the allowable is reached; from there on, the allowable would be used instead of the actual producing ability of the well. This condition would, of course, presuppose the necessity for manual or other control of each well to limit its production to the allowable quantity.


SQUARED PRESSURE DIFFERENTIAL – THOUSANDS
FLOW – M.C.F. PER 24 HOURS
FIG. 10
COMPOSITE CURVE FOR TOTAL SYSTEM
CONTROL WELL "A"
Pc² = 160.00 (THOUSANDS)


COMPRESSOR STATION SUCTION PRESSURE – POUNDS PER SQUARE INCH ABSOLUTE
FLOW – M.C.F. PER 24 HOURS
FIG. 11
DIRECT READING
COMPOSITE CURVE FOR TOTAL SYSTEM

U. O. P. isomerization process multiplies isobutane supply

That means increasing production of 100-octane gasoline for Uncle Sam's fighting flyers

In producing 100-octane gasoline, one important step is alkylation That means combining olefin molecules with isoparaffin molecules catalytically to make a product called alkylate, that is more valuable than either

Isobutane is the paraffin that combines readily with the olefins, and the supply of natural isobutane is strictly limited

There is plenty of normal butane in natural gas, in refinery gases, in gases from storage tanks—but more isobutane is needed

That's where the U.O.P. catalytic isomerization process comes in It converts normal butane into isobutane, economically and efficiently

The process is described in U. S. Patents 2,283,142 and 2,283,143 which issued to Universal on May 12, 1942

It is available to every refiner who can use it—under license from Universal

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

THE REFINERS INSTITUTE OF PETROLEUM TECHNOLOGY

Catalyst Revived Continuously To Improve War-Product Yields

By J. P. O'DONNELL

By modifying the Houdry catalytic cracking procedure to permit continuous revivification of a portion of the catalyst present in the system, engineers of the Socony-Vacuum Oil Co., Inc., have developed much greater flexibility in the ability of the normal unit to use different charging stocks and produce simultaneously much higher yields of aviation fuels, toluene, and source stocks for synthetic rubber. The revised operation can be applied to ordinary thermal cracking with a relatively small investment to be made in the added equipment.

A NEW continuous catalytic cracking process which is particularly attractive from the standpoint of the critical materials required in its construction and which may also be adapted to existing thermal cracking equipment is being utilized in the production of aviation-gasoline base stock, source material for butadiene and nitration-grade toluene. The process is known as Thermofor catalytic cracking.

It was developed by engineers of the Socony-Vacuum Oil Co., Inc., and embodies principles involved in the Houdry catalytic cracking process and in the Thermofor kiln, described in the November 17, 1939, issue of The Oil and Gas Journal and in the December 25, 1940, issue of Transactions of American Institute of Chemical Engineers. Construction and engineering work on plants under construction and projected is being done by the Lummus Co. and the process is licensed by Houdry Process Corp. through Lummus and E. B. Badger & Sons.

Socony-Vacuum engineers have been closely associated with the development of the Houdry process and themselves developed the Thermofor kiln, five of which are now in operation in this country and one abroad. Because it involves principles already proven in these commercial installations, the new process has the advantages of proven characteristics behind it. However, possibly its greatest advantage at the moment lies in its ready adaptability to existing thermal cracking equipment. Because of the decline in demand for motor gasoline, thermal cracking units in many parts of the country are being shut down. By utilizing the heaters, bubble towers, stabilizers, pumps, heat exchangers, instruments and auxiliary equipment of these units in connection with the reactors, regenerators, etc., of the new process, substantial savings in time, material and money are possible.

New Operation Simple

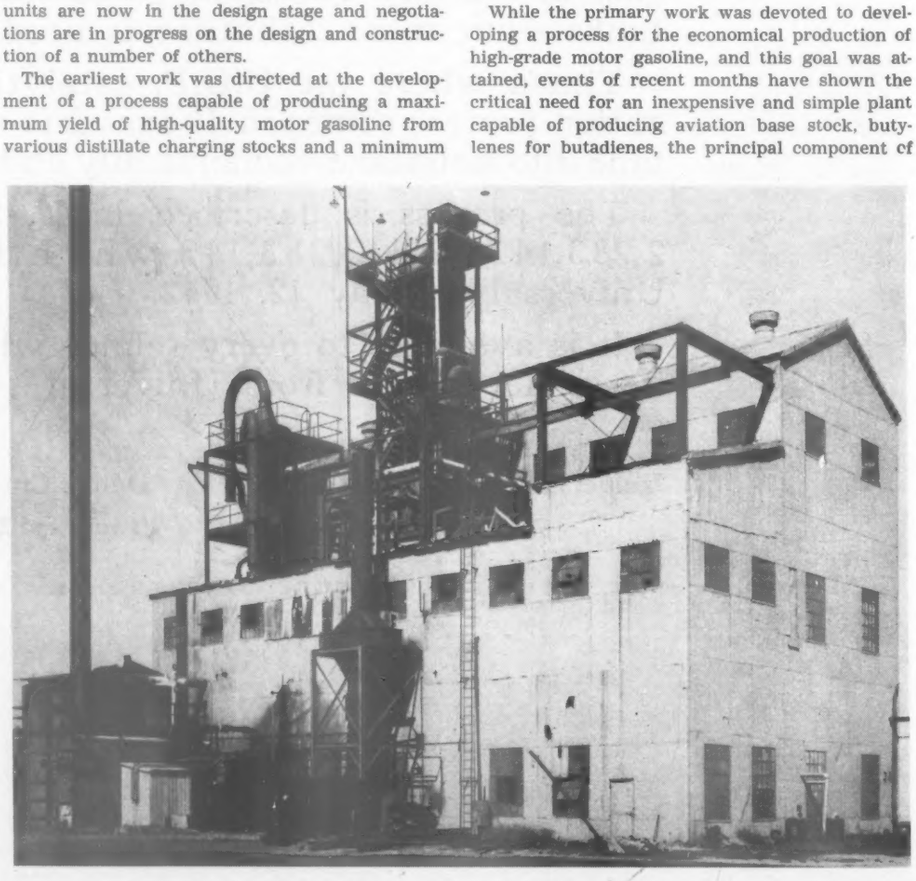
Construction of entirely new plants is also less expensive from the important materials standpoint because of the simplicity of the new operation. The materials required for building Thermofor catalytic cracking plants are largely carbon steel with the exception of the Sichromo 4-6 tubes and internals of the kilns. The other materials are simple structural forms, light steel plate, gray iron castings, readily available low chrome, and nonferrous alloy tubing and light sheets. Electrical and mechanical equipment including pumps, drivers and instruments are of conventional design commonly employed in oil refineries. The catalyst cost on the basis of present experience would average approximately 3 cents per barrel of charge. Waste heat recovery is utilized for the generation of steam. In one unit this amounts to 52,000 to 65,000 lb. per hour of 450-lb. steam and 15,000 lb. per hour of 150-lb. steam. Designs have already been completed for plants ranging in capacity from 2,300 to 30,000 bbl. of gas oil per day.

Initial work on the process was undertaken 5 years ago. In the latter part of 1940, Socony-Vacuum erected a pilot plant with a once-through capacity of from 400 to 550 bbl. of gas oil per day depending on the character of the charge and the type of operation. Based on experience to date, an operating time factor of as high as 95 per cent can be reasonably expected in commercial units. Since then a 20,000-bbl.-per-day unit has been designed and is now under construction at a Socony-Vacuum refinery and two additional units have been authorized. The first unit will be in operation within a year. In addition, a number of other units are now in the design stage and negotiations are in progress on the design and construction of a number of others.

The earliest work was directed at the development of a process capable of producing a maximum yield of high-quality motor gasoline from various distillate charging stocks and a minimum yield of lighter gaseous material and carbon deposit. As is obvious from the fact that it is continuous, it involves a moving catalyst bed with two chambers, one in which the reaction takes place and the other for regenerating the catalyst. Catalyst regeneration is carried out in the so-called Thermofor kiln. A system of elevators circulates the catalyst between the reactor and regenerator. Otherwise the flow is entirely by gravity. Prior work by Socony-Vacuum engineers on clay flow from the standpoint of attrition, distribution, diffusion rates in burning out of carbon, etc., made possible the utilization of the Thermofor kiln for this purpose.

The method of handling the catalyst in the Thermofor catalytic cracking process was developed as a result of this work and it is this method which constitutes the principle distinguishing feature. Otherwise it is similar to normal oil distillation procedure. The reduced crude charge is delivered to a two-coil furnace. In one coil it is heated for tar separation, a step which may be eliminated when a straight distillate charge is used, and in the other it is superheated prior to entering the reaction chamber. After it leaves the reactor the product is fractionated in a conventional manner. Bottoms from the fractionator may be recycled through the reactor.

While the primary work was devoted to developing a process for the economical production of high-grade motor gasoline, and this goal was attained, events of recent months have shown the critical need for an inexpensive and simple plant capable of producing aviation base stock, butylenes for butadienes, the principal component of



The pilot plant in which the Thermofor catalytic cracking process was developed

synthetic rubber, and nitration-grade toluene. Accordingly, development work was undertaken to determine the applicability of the process to this field. This work demonstrated that the process is well suited to this purpose. It showed that the unit may be operated for (1) maximum 400 end-point gasoline with a high liquid recovery (2) at higher temperatures for the production of maximum butane-butylene but with a high percentage of butylene, or (3) at some intermediate condition.

Yields of 35 to 45 per cent of 400 end-point gasoline may be obtained on a once-through operation and from 50 to 60 per cent on a recycling operation from high end-point gas oil.

By second-pass processing, yields of 85 to 100 per cent of the 300 end-point gasoline fraction present in the first-pass product have been obtained. This material furnishes an excellent base for the manufacture of 100-octane aviation gasoline. The recycling operation may also be used to produce 20 to 35 per cent of a high butylene content cut in contrast to 6 to 15 per cent in normal operation. As in all refining processes, the yields vary with the type of charging stock. Heavy motor gasoline and a gas-oil cut, as high as 95 per cent of which is suitable for No. 2 fuel, and gas, are obtained as byproducts of this two-pass operation.

Of secondary interest at the moment is the fact that in peacetime operation the plant would be capable of producing high-grade motor gasoline, aviation gasoline and high-grade diesel and furnace oils.

Reclamation and Maintenance Of Electrical Equipment

THERE appear to be few limitations to the possible salvage operations in the field of transmission and utilization of electric power except in the case of broken porcelain and charred organic insulation. The ingenuity of the individual engaged in this particular work will determine the results. Nuts, bolts, washers, clamps and other pole-line equipment and other hardwares are readily salvable; they may be straightened, reformed, rethreaded, chemically cleaned and regalvanized or cadmium plated at nominal cost. Damaged connectors, cutouts, small arresters, fuse holders and like equipment are often reconditioned by a simple exchange of undamaged parts.

Service and distribution wire from which the insulation has weathered are removed from service and run between small motor-driven rollers, which press the remaining portions of the deteriorated weatherproof insulation from the solid copper conductors and permit resplicing the bare wire into coils of suitable length. Many scraps of pipe and conduit may be welded or threaded and coupled, into new nonstandard lengths. The undamaged portions of burned-out coil or winding may be salvaged and carefully rewound into another of either like or different form and application. A worn motor shaft can be built up by applying layers of weld metal and then turning the shaft down in a lathe so that it will fit either a standard bearing or one that has been bored to a larger diameter.

Repair Bushings

Bushings of a type not readily rebuildable may generally be given some minor repairs and reused in apparatus of lower voltage. They may also be installed in ground legs wherein only mechanical oil tightness and a very low value of insulation are the requirements.

Simple adapter flanges, fashioned from salvaged sections of iron pipe and scrap boiler plate, permit ready interchangeability between the bushings and apparatus of different manufacture.

Although all lines of bushings have been materially improved, old bushings can no longer be considered obsolete; they are merely antiquated. A study of the details of the improvements, not only in bushings but in all other kinds of apparatus, will disclose the weaknesses of the older units and will provide clues for making simple adaptations of the principal modernizing features.

This is the case with the semimodern mush-room type distribution transformer bushing which can be modernized by an extension of the varnished cambric tape (covering the antioil-siphoning gap) to a point well within the porcelain and sealing it with a hard-setting compound. The same principle of cementing and sealing may be used with marked success on the side-wall-mounted bushing found in many transformers.

Offending air space may be filled with a synthetic porcelain cement having a coefficient of expansion similar to that of porcelain and with oil and acid-proof characteristics. Spider-type spring washers may be used on the inside end of the conductor, permitting a free circulation of oil within the bushing.

It is seldom necessary to discard severely pitted oil-breaker and air-breaker switch contacts. They may be built up with sil-phos or phos-copper and silver plated to reduce the resultant high contact resistance and returned to service. If a high-voltage transmission line is equipped with flat, cast-bronze contact shoes as part of the sectionalizing switches, it is well to investigate the hazard of contact deterioration as a result of a combination of copper and zinc oxides and repeated fault currents which might be corrected by a planned program of silver plating.

A simple means of protecting these air-break sectionalizing switches against severe sleet and ice conditions is to equip the knuckle joints of the operating mechanism linkages with heavy duck hoods fabricated in rectangular shape 12 by 18 in. and equipped with metallic eyelets.

In the rehabilitation of a slightly damaged transformer, regulator or motor, and generator coils, mica tape will very often eliminate the necessity for a complete coil rewind.

Many pieces of old worn-out machinery, designed for an entirely different purpose, can be converted to some machine for maintenance and repair jobs. For instance a 50 kva., 10-panel, single and three-phase test board was constructed entirely from the salvage of an old plant; a heavy-duty coil-winding machine was fabricated from old automobile parts; a barrel washer was made from an old air-break-switch motor-operated mechanism; an old drill press was converted into a gasket-cutting machine; and a simple transformer drier was made from an old tin can and an old vacuum sweeper head. This latter unit is used on spare transformers which are slightly wet but not enough so to justify oven drying.

The old pole-mounted transformers which are so bad about blowing fuses can have this fault corrected for the cost of one fuse replacement. The terminal board is removed and discarded, the tap leads cut off and taped up, the bushing pockets are bored to accommodate a more modern bushing, the dirty oil is cleaned or replaced, the sludge is removed, the cover gasket renewed and a simple universal adapter is added to the mounting lugs. The direct cost of this rehabilitation is nominal and the amount of material used is much less than it would have been had the unit been discarded and replaced with a new transformer.

Weld Transformer Tanks

Cracked cast-iron transformer tanks and covers can be welded or the cracks can be chipped out and filled with any good cast-iron arc-welding rod. This is then coated with a layer of free-flowing solder (using the proper flux) and the porosity overcome. Such a seepproof weld will give years of additional life to an otherwise useless unit.

It is wise at the present time to save a sufficient number of small containers and their covers to use when paints, varnishes, etc., will only be obtainable in large drums. Ordinary wiping cloths can be laundered, and rubber gloves, rubber blankets, line hose and other protective equipment can be vulcanized when the damage or weakness is confined to a small area.

A good insulating oil seldom wears out. The contamination caused by carbon, fibers, dust, corrosive salts, acids, resins and other products may be removed with a blotter press. If the oil is "worn out" and cannot be reconditioned by the simpler methods it will be necessary to re-refine it to put it back into condition. The treatment varies with the condition of the oil but will cost from 3 to 10 cents per gallon.

The ordinary repair of damaged equipment is a fairly simple task, but the performance of adequate preventive maintenance demands the supervisory services of an engineer trained for that function. He must know the average life, the mechanical weaknesses, the fundamental design, the peculiar characteristics, the result of possible abuses, and the operating history, original cost, replacement value and numerous other things concerning each type of apparatus.

Pole-mounted transformers have been found to operate for 10 years practically without trouble, with failures averaging less than 1 per cent. The transformer can be tested for high potential, over-potential, and voltage ratio before putting it into service. In some cases it may also be well to check the power factor, resistance, heat generation, regulation and efficiency.

Normal repairs include repairing or replacing leads and bushings, cleaning tanks and cores, re-refining the oil, replacing cover gaskets, repainting the tanks, installing new mounting lugs, and equipping the unit with special lug adapters. The sludge is removed by flushing the interior with hot oil at about 30-lb. pressure. A quick-setting oilproof putty is used successfully to reseal the chips and cracks found in the compound which cements the bushing to the tank. The felt-cover gaskets are oilproofed by dipping in special varnish just before being installed.

It is well to have a more comprehensive program for transformers having a cost of over $750; to this group can be added transmission-line oil circuit breakers and their oil-filled instrument

Pumping this 3600-foot East Texas well *is a relatively light job today. But, should the load get really heavy, this "Oilwell" TC-23 Unit will go on pumping smoothly and with utmost reliability. Its great service range assures efficient operation as well conditions change over the years.*

SPECIFICATIONS

Unit	TC-23	TC-23	TC-33H	TC-33H
Set up for maximum stroke of ..(inches)	54	84-½	84	74
Polished-Rod Capacity (A.P.I. Rating) .....(pounds)	17,400	16,000	21,000	19,500
Peak-Torque Capacity at 20 s.p.m. (A.P.I.) .....(inch-lbs.)	115,000	115,000	160,000	160,000
Overall Gear Ratio	32.26:1	32.26:1	31.5:1	31.5:1

SEND FOR NEW BULLETINS

New descriptive bulletins U5-142 (TC-23 Unit) and U6-442 (TC-33H Unit) are yours for the asking. Also other up-to-date bulletins covering the complete "Oilwell" line of modern pumping units. Write today to Dept. P, Oil Well Supply Company, Dallas, Texas, or ask for copies at the nearest "Oilwell" store.

THE versatile, *new* "Oilwell" TC-23 and TC-33H Pumping Units perform with smooth efficiency over extremely wide service ranges. *Each* unit is given the operating flexibility of *two* different units by a unique construction feature which makes available *two* combinations of stroke lengths. One combination provides longer strokes; the other provides higher polished-rod load capacities.

The conversion from one combination of stroke lengths to the other is accomplished by (1) reversing the position of the saddle trunnion assembly on the walking beam, and (2) moving the samson post on the base beams to an alternate set of bolt holes. No change in foundation nor extra machine work is required. The additional operating flexibility resulting from this conversion feature may prove to be a life-saver on a well in which pumping conditions are likely to change from time to time.

SOME OTHER TIME-PROVED ADVANTAGES

- Short or extended structural-steel base with skid-type ends.
- Rigid, derrick-type samson post with ladder and safety loop.
- Knuckle-joint pitmans with self-aligning wrist-pin roller bearings provide complete equalization of pitman loading and make it easy to change stroke lengths.
- Type "B" Counterweight Cranks facilitate accurate adjustment of counterbalance effect.
- Precision-hobbed, fully heat-treated steel gears and pinions. All shafts rotate in shim-adjustable tapered roller bearings, rigidly supported in heavily ribbed, cast semi-steel gear cases.
- Mechanical brake with remote control.

OIL WELL SUPPLY COMPANY

EXECUTIVE OFFICE—DALLAS, TEXAS
DIVISION OFFICES—OIL CITY, PA.
DALLAS, TEXAS LOS ANGELES, CALIF.

Branch Stores Serving All Oil Fields
United States Steel Corporation Subsidiary

EXPORT DIVISION OFFICE—
30 ROCKEFELLER PLAZA
NEW YORK CITY

transformers. These units should be inspected every 3 years. The inspection includes an overall of tanks and accessories with minor repairs being made at the time of inspection. Also the following: Megger and/or power-factor measurements of the bushings and other insulations; dielectric test of the insulating oil and chemical analysis if needed; internal inspection for corrosion, moisture, carbon and sludge; inspection of ground connections and protective devices; and analysis of breaker mechanisms, toggle adjustments and other mechanical parts. A suitable record is kept of the inspection data.

A flashlight and a long-handled, adjustable mirror are of great value in determining the presence of corrosion. A special tube with an airtight eyepiece, an internal-inspection light, and a small amount of air pressure permit the inspection of the terminal board, core, or coils without lowering the oil level.

A Cincinnati timer, or similar device, can be used to test the breaker mechanism, etc., and assure the proper adjustment or locate a faulty toggle.

Close supervision of voltage regulators is essential. Annual oil samples, and monthly visits to see if there are any signs of distress (indicated by excess noise, sluggish operation, failure to function and need for frequent adjustment) are necessary. The units can also be cleaned and lubricated on the monthly visits.

Oil circuit breakers should also be inspected often. A program of bypassing the circuit breaker and putting it through its paces about once each 3 months will assure proper lubrication and will prevent corrosion. Inspection of the contacts and the oil can be determined by considering the following conditions: (1) Type of breaker and average interrupting capacity; (2) average interrupting duty imposed; (3) average number of service operations to produce contact deterioration and medium deposits of colloidal carbon; (4) susceptibility to moisture contamination; (5) importance of the breaker in the system; and (6) inherent characteristics of the breaker. overheating and organic insulation doubles its

It is well to remember that overloading causes rate of deterioration with each temperature rise of 8° C. Also, insulation oils should never be operated at temperatures above 90° C. Spare transformers are more susceptible to moisture contamination than the unit in service.

Adapted from material submitted by Oklahoma Gas & Electric Co.

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Care of Return-Bend Fittings Keeps Refineries Operating

By M. E. BURKHART
Chief Engineer, Key Co.

RETURN-BEND fittings play an important part in the manufacture of gasoline, lubricating oils, fuel oils, distillates, etc. The majority of these fittings are manufactured from alloy steels which can only be purchased with high priority ratings. Therefore, it is important that equipment now in the refinery yard be maintained more effectively than ever.

The limitation of an installation stress to that which is necessary to make up a gas-tight joint, and the avoidance of overwrenching will increase the life of the threaded parts of the fittings and prevent distortion in the seats. Excessive loading of threaded parts under stress eventually will cause distortion and shorten the useful life of that part.

Also essential to proper maintenance is the thorough cleansing of threaded parts and joints that are to be made up by mechanical loads. One of the most common methods used in the refinery yard is the buffing of studs, screws, tapered seats, etc., with air or electrically driven wire brushes. This is a superficial method of cleansing.

Our company recommends that such parts commonly known as bull nuts, dogs, screws, tapered plugs and ring joint plugs be washed by immersion in a solution of Okemco (as manufactured by Oakite Products, Inc.) or its equal.

Providing Okemco is used for washing, the solution should be 4 to 8 oz. to each gallon of water at a temperature of 180° to 212° F. The parts to be washed should be soaked approximately 2 hours depending upon condition of the parts and the heating facilities.

The removal of scale or graphite is done in a separate tank, preferably a wood cask, with Oakite Compound No. 32. On larger surfaces that cannot be immersed in a tank, this compound may be sprayed or brushed on. Following this operation it is suggested that the parts be placed on a tray over the Okemco tank and washed with a steam gun to remove the particles of scale that were loosened in the solution. The parts should then be rinsed in clear water with the steam gun and placed into the tank long enough for the metal to get hot. Remove the parts from the tank and allow them to dry; the film on the parts will serve as an antirust.

The inspection of threaded parts and closure plugs for minor defects after they are thoroughly cleansed by the above method will be much easier than attempting to inspect these parts when they are smudged with graphite or coated with scale. It will also prevent any small particles or grit or foreign matter from adhering to the threads and tapered seats, thereby causing galling in the threaded parts or scarring or marring of the tapered seats. This thorough cleansing process will insure longer life of the closure mechanism by removal of all foreign matter.

After thoroughly inspecting the cleaned parts each should be lubricated with a graphite and oil mixture.

Thorough cleaning and lubricating will reduce friction and also reduce the wrench effort required to make a tight joint. These precautions will tend to lengthen the life of the equipment now in service.

Distorted, pitted and marred plug seats can be repaired by remachining or refacing the plugs and installing renewable seats in the fittings. Fittings need not be discarded from service merely because the closure plugs and seats are in such condition that it is impossible to make up and maintain tight joints. They may be reconditioned.

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A.P.I. and S.A.E. Organize New Research Council

A NEW organization, the Cooperative Research Council, sponsored jointly by the Society of Automotive Engineers and American Petroleum Institute, has been created to centralize, correlate, and promote cooperative research activities of the automotive, aeronautic, and petroleum industries. The council formally began operation from its new headquarters in Room 1618, 30 Rockefeller Plaza, New York, in May.

The Cooperative Research Council consists of 12 members appointed to serve for 1 year.

S.A.E. representatives are: B. B. Bachman, Autocar Co.; J. M. Crawford, Chevrolet Division, General Motors Corp.; William Littlewood, American Airlines, Inc.; J. B. Maccauley, Jr., Chrysler Corp.; Arthur Nutt, Wright Aeronautical Corp., and C. G. A. Rosen, Caterpillar Tractor Co.

A.P.I. representatives are: D. P. Barnard, Standard Oil Co. (Indiana); A. L. Clayden, Sun Oil Co.; T.G. Delbridge, Atlantic Refining Co.; R. A. Halloran, Standard Oil Co. of California; K. G. Mackenzie, Texas Co., and G. G. Oberfell, Phillips Petroleum Co.

B. B. Bachman is chairman, and T. G. Delbridge, vice chairman. C. B. Veal is secretary of the council, and R. P. Anderson, division of refining of the A.P.I., is treasurer.

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Intermittent Use of Steam Valves

PIPE dope should be used only on the male end of a joint. Otherwise it is likely to damage valve seats when it gets inside the piping. Valves and fitting should be thoroughly inspected for dirt before putting them in a line.

It is not good practice to put the valve in a vise when making up a joint. There is danger of giving it too much squeeze which can distort and damage the working parts or even crush the valve. A wrench should not be used on the hex away from the joint or unsupported end of the pipe as this might twist the valve body. Never use a "hickey" to make up a joint. Too much leverage will twist a valve out of shape and stretch or crack a fitting. Use only the right-size wrench. On hex-end valves a monkey wrench always does a better job. Don't install a valve while it is in open position. The chance of twisting it is always lessened when it is in closed position. Don't cut overlength threads on a pipe to be screwed into a valve as the pipe might shoulder against the valve seat and injure it beyond repair. Don't install a valve so it will carry the weight, sag or expansion of a line. Proper supports and expansion bends or joints should be provided. Pipe flanges should be lined up properly when putting in a line as undue stress on the flanges may distort the valve. Don't install automatic stop and check valves in any but an upright position, as the disk and piston must have a gravity drop for satisfactory operation.

Influence of Structure On High-Temperature Strength

By C. L. CLARK
Timken Roller Bearing Co.

PART 2—INTERMEDIATE ALLOY STEELS

This is the tenth of a series of articles by the author

MOST of the work done to date on the effect of microstructure on the high-temperature strength has been confined to the lower alloyed steels. The reason for this is obvious. Steels of this type can be made with controlled grain coarsening characteristics and it is thus possible to produce different grain size, and variations in the carbide structure, at temperatures within the range commercially feasible for the steel in question. With the higher alloyed steels, however, the amount of alloy addition which must be made often masks the effect of those elements which are used for controlling the coarsening temperature. Consequently temperatures beyond those which are practical from a commercial standpoint may be required to produce the desired type structures.

Even though it may not be possible to produce commercially various type microstructures in the intermediate alloy steels, it is of interest to ascertain if variations in structures do have the same influence as was found with the low alloyed steels. The steel chosen for this purpose was 5 Cr Mo and the creep characteristics at 1,100° and 1,200° F., after four different heat treatments, are given in Fig. 1. Typical microstructures, resulting from these treatments, are given in Fig. 2.

The range in creep strength for 5 Cr Mo, after the various heat treatments and thus different type structures, is not as pronounced as with the lower alloy steels. On the basis of the stress for a creep rate of 0.10 per cent per 1,000 hours, the range of 1,100° F. is only from 5,000 to 6,000 lb. and at 1,200° F. from 2,800 to 3,300 lb. This represents a difference of about 20 per cent at each temperature. Furthermore, the same type structure does not possess the maximum strength at both temperatures. At 1,100° F., the fine-grained structure was superior while at 1,200° F. a 5 to 7-grain size gave the best strength. Unlike the condition existing with DM steel, the acicular structure was not outstanding at either temperature.

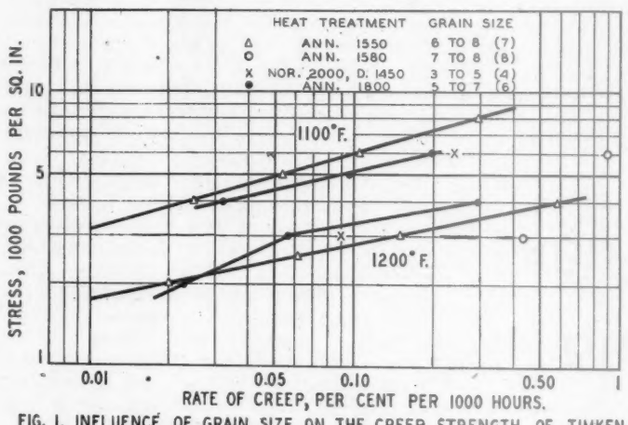
HEAT TREATMENT GRAIN SIZE
△ ANN. 1550 6 TO 8 (7)
○ ANN. 1580 7 TO 8 (8)
X NOR. 2000, D. 1450 3 TO 5 (4)
● ANN. 1800 5 TO 7 (6)
1100°F.
1200°F.
STRESS, 1000 POUNDS PER SQ. IN.
RATE OF CREEP, PER CENT PER 1000 HOURS.

FIG. 1. INFLUENCE OF GRAIN SIZE ON THE CREEP STRENGTH OF TIMKEN 4-6 Cr.Mo. STEEL.

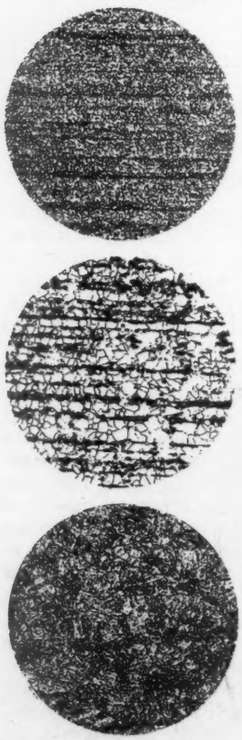

Fig. 2—Typical microstructures of 5 Cr Mo steel after different heat treatments. (a) Top: Annealed 1,580° F. (b) Center: Annealed 1,800° F. (c) Bottom: Normalized 2,000° F., drawn 1,450° F.

The effect of these same variations in structure on the rupture strength at 1,100° and 1,200° F. is shown in Fig. 3. Under these more rapid rates of loading the acicular type structure, produced by normalizing from 2,000° F., does have the superior strength at both temperatures, but its degree of superiority is not overly marked, being of the order of 10 per cent. The finest grained structure possesses the lowest strength while the grain sizes of 6 to 8 and 5 to 7 give equal rupture strengths.

Unlike conditions found in the low alloyed steel, grain size, rather than carbide formation, appears to be the controlling factor in so far as the creep and rupture strength of the 5 Cr Mo steel is concerned. This condition is shown in Fig. 4 in which these strength characteristics are plotted against the predominating structural grain size. In the case of the 1,000-hour rupture strength, the strength decreases continuously as the grain size becomes smaller. With the creep characteristics, the creep rate decreases (the strength increases) to a certain grain size and then increases as the grain size becomes smaller. This would indicate a grain size of 7 to impart maximum creep resistance at 1,100° F. and one of 6 to be superior at 1,200° F.

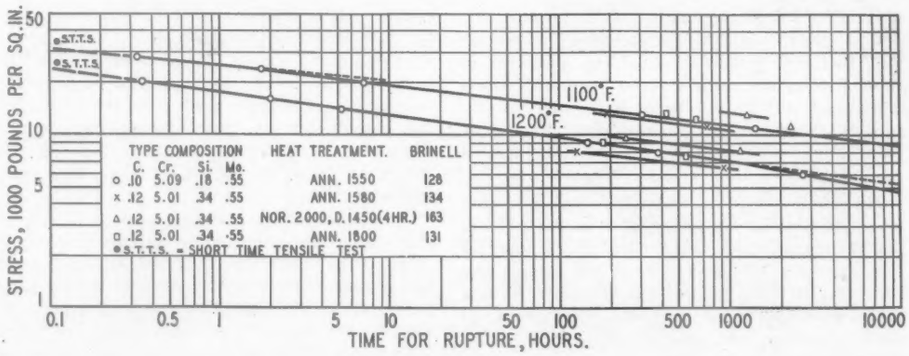
●S.T.T.S.
●S.T.T.S.
1100°F.
1200°F.
TYPE COMPOSITION HEAT TREATMENT. BRINELL
C. Cr. Si. Mo.
○ .10 5.09 .18 .55 ANN. 1550 128
× .12 5.01 .34 .55 ANN. 1580 134
△ .12 5.01 .34 .55 NOR. 2000, D. 1450(4 HR.) 163
□ .12 5.01 .34 .55 ANN. 1800 131
●S.T.T.S. = SHORT TIME TENSILE TEST
STRESS, 1000 POUNDS PER SQ. IN.
TIME FOR RUPTURE, HOURS.

FIG. 3. STRESS-RUPTURE CHARACTERISTICS AT 1100°F. AND 1200°F. OF TIMKEN 4-6 Cr.Mo. STEELS.

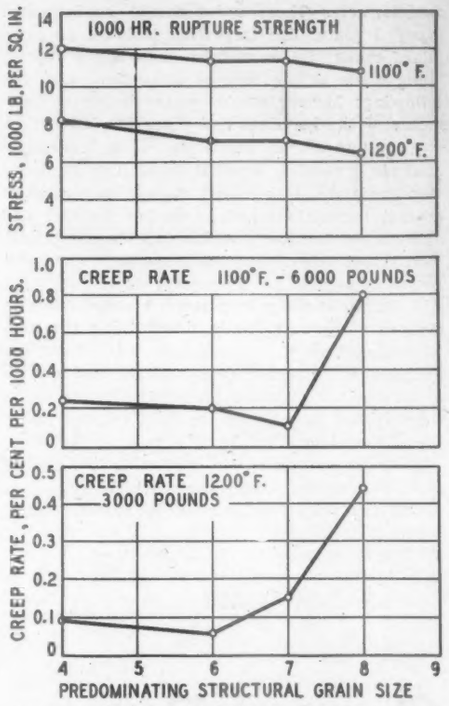
1000 HR. RUPTURE STRENGTH
1100° F.
1200° F.
STRESS, 1000 LB. PER SQ. IN.
CREEP RATE 1100°F. - 6000 POUNDS
CREEP RATE 1200°F. 3000 POUNDS
CREEP RATE, PER CENT PER 1000 HOURS.
PREDOMINATING STRUCTURAL GRAIN SIZE

FIG. 4. INFLUENCE OF GRAIN SIZE ON THE RUPTURE AND CREEP STRENGTH OF 4-6 Cr. Mo. STEEL AT 1100 AND 1200°F.

The results presented are sufficient to indicate that too broad generalizations cannot be drawn with respect to the influence of structure on the high-temperature strength. With the low alloyed steels the improvement in strength resulting from a coarse grain size, accompanied by an acicular or Widmanstatten type structure, is very pronounced. With a steel of the 5 Cr Mo type, however, the degree of improvement is of a low order of magnitude and the temperatures required to produce coarsening are of such a magnitude that excessive scaling and bad surface would result from the required heat treatment.

Previous articles in this series appeared in the issues of The Oil and Gas Journal as follows: October 2, 1941, Page 39; November 27, 1941, Page 69; January 8, 1942, Page 43; February 5, 1942, Page 35; February 26, 1942, Page 83; March 19, 1942, Page 48; April 2, 1942, Page 39; April 23, 1942, Page 72, and May 21, 1942, Page 44.

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TYPICAL OIL-FIELD STRUCTURES

Regular Anticlinal Fold

Kettleman Hills Field, California

(Compiled by The Oil and Gas Journal)

GENERAL GEOLOGY: The Kettleman Hills area lies on the west side of the San Joaquin Valley which forms the south end of the Great Valley of California. The valley forms a deep basin between the Coast Ranges and the Sierra Nevada, and is filled with a great thickness of sediments of which the lower beds are mainly marine and the upper beds largely continental and fresh-water deposits.

The Coast Ranges are a complex series of fault blocks set en echelon. The Diablo Range, which is the easternmost range, involves a thick sedimentary series totaling more than 23,000 ft. in thickness ranging from Jurassic to Recent in age. The Kettleman Hills lie on a zone of folding and faulting which extends from the middle part of the Diablo Range and includes the Coalinga and Lost Hills anticlines.

GEOLOGICAL HISTORY: The San Joaquin Valley is underlain by a basement complex of pre-Cretaceous age. Structural indications show that the basement, like the Sierra Nevada, is slightly faulted and that it is mainly a continuation of the Sierra, except along the west side where it takes on more of the appearance of the Coast Ranges. Subsidence of the valley began during Upper Jurassic time along the west side and Cretaceous and Eocene deposits were later laid down. The eastern edges of these deposits wedge out between the basement and the Miocene except in the northern part of the valley. The Miocene beds extend completely around the southern end of the valley with equivalent paleontological zones but with different facies, indicating that the series is continuous, but that the source of the materials are different. Above them lie Pliocene marine and nonmarine beds while the greater part of the valley is covered by thick deposits of Pleistocene and recent alluvium. The thickness of sedimentary rocks is of the order of 25,000 ft. a short distance from the foothills along the west side of the valley.

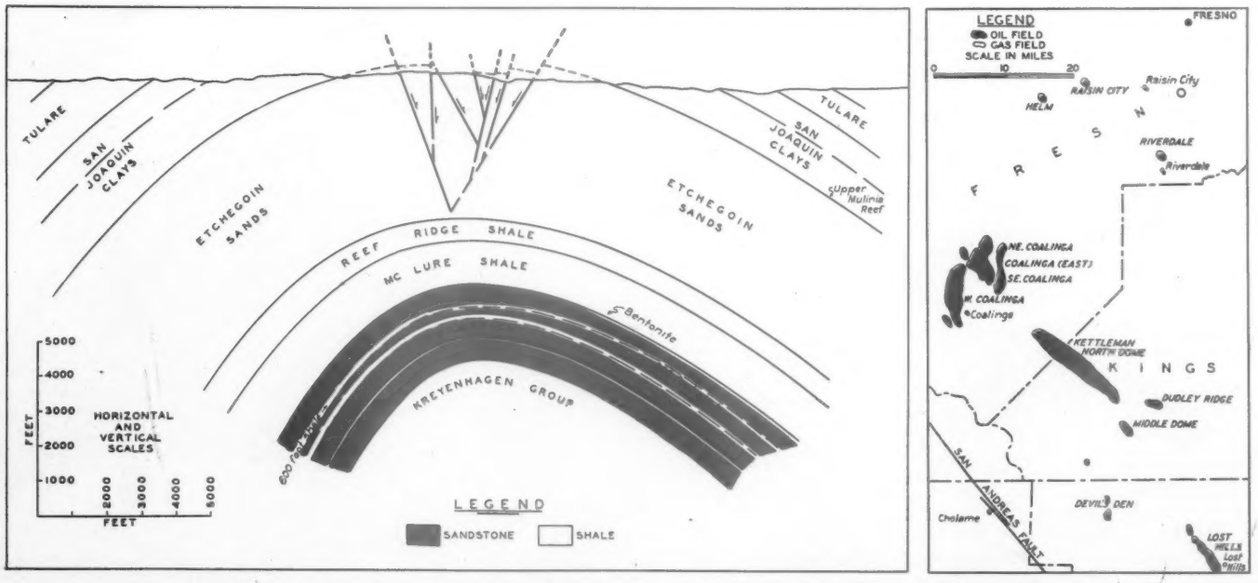
In the vicinity of Kettleman Hills, at least, movements were continuous from the Jurassic to recent times with the result that there are a great many unconformities in the section when upward movements lifted the area for a time above sea level. These oscillations in a subsiding basin give rise to numerous tongues of clastics, mainly sand, and, consequently, a large number of wedge edges which may prove productive. Thus production is found at different levels in the section and widespread correlation of pays from one field to another is difficult.

In the Kettleman Hills field, production was first found in the Temblor formation of Miocene age and later in the Avenal (Eocene) which underlies the Kreyenhagen as shown in the accompanying section.

STRUCTURE: Kettleman Hills consists of two elongated domes, North dome and Middle dome. Of these, the latter is unimportant as an oil producer. Closure on the North dome on the top of Temblor is 2,000 ft. and the crest plunges 5°-6° to the north and 8° to the south toward the Middle dome. On the northeast flank the surface beds have a maximum dip of 35° while on the southwest flank they are steeper, being 45° on the surface and 65° on the Temblor.

There is a complex series of faults on the crest of the structure but these are mainly normal faults along which blocks have been dropped down due to the tension of the unconsolidated upper formations during folding. They do not, apparently, penetrate the structure to the producing horizons.

ORIGIN OF THE OIL: For many years it has been thought that oil in California was derived from great thicknesses of diatomaceous shales occurring at different levels in the section. However, recent investigations have shown that the diatoms frequently do not occur in the section near the oil-



Left: East-west cross-section across Kettleman Hills structure. Right: Oil-field map of Kettleman Hills area

producing rocks. At Kettleman Hills, the Kreyenhagen, underlying the Temblor, is highly bituminous and this has been considered by some to be the source of the oil. However, other sources are possible, namely brown shales above the Temblor and shale equivalent of the producing sands downdip.

The origin of oil in sand bodies of this type is important, if it could be determined to general satisfaction, as the relationship between the source and the reservoir could be used to guide prospecting in virgin territory. However, in anticlinal fields of the Kettleman Hills type, where the sand blankets the whole structure, drilling is based on the structure as a whole rather than on a search for the particular part of the structure where reservoir conditions are thought to be most favorable.

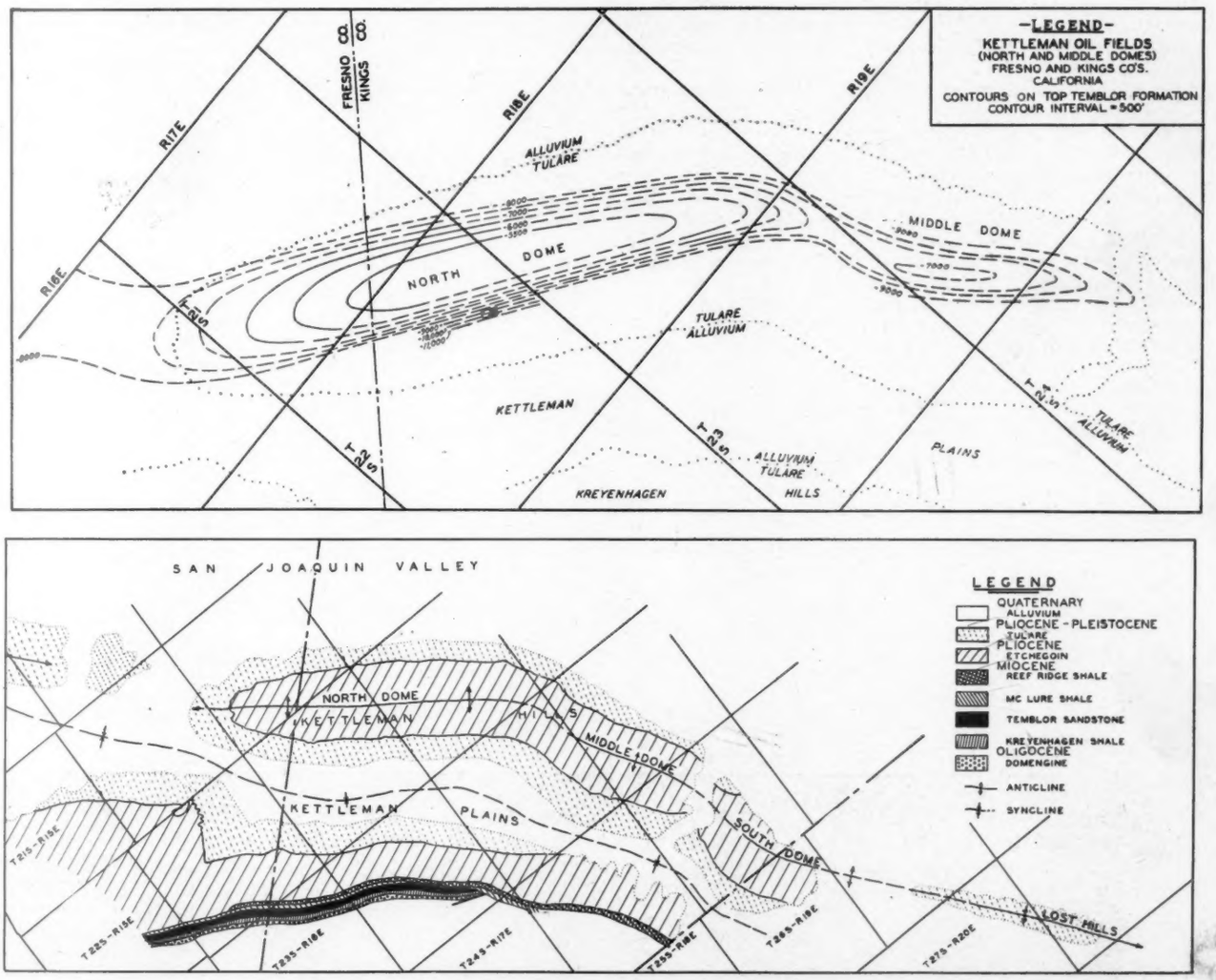
OTHER FIELDS OF THE SAME TYPE: Although the anticlinal theory is the oldest relative to the occurrence of oil, true anticlines are comparatively rare. They occur mainly in basins where a thick series of relatively soft sediments have been compressed between more resistant uplifted masses. Most of the fields of the Los Angeles Basin are of this type as well as a number along the western edge of the San Joaquin Valley. However, the latter district also contains many fields closely associated with wedge edges.

An area in which there are numerous basins surrounded by arcuate uplifts is the Rocky Mountain district consisting of Wyoming, Colorado and Northwest New Mexico. Here strong anticlines such as Salt Creek, Lance Creek and domes form the principal structures. In the Appalachian area, where the anticlinal theory was formulated, the true anticlinal occurrence of oil is less common than in either California or the Rocky Mountain district. Recently a number of strong elongated anticlines have been productive in southwestern Arkansas.

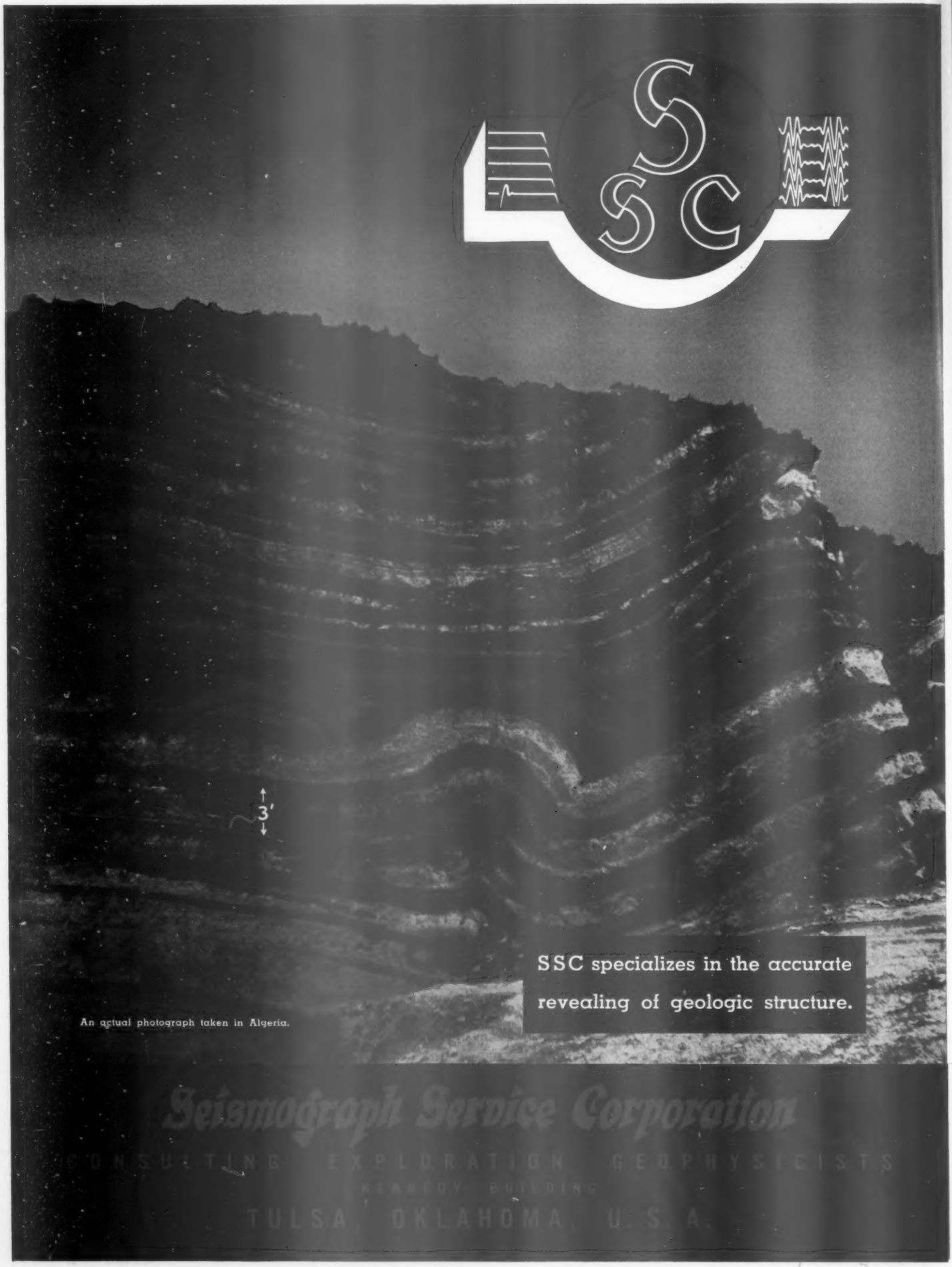
EXPLORATION METHODS: Kettleman Hills and many of the Wyoming structures stand out so prominently on the surface that they can hardly be missed even by a casual survey. This is not true of many other anticlinal folds, however, as they are frequently masked by large thicknesses of sediments lying unconformably above them. The general rule that once an area is uplifted, further elevation will be along the same general axis causes many deep-seated oil-bearing anticlines to be reflected at the surface. There is also a general belief that sediments deposited above an anticlinal core will be compacted so that they will reflect the underlying structure in the absence of further movements.

Subsurface geological methods are most adaptable to the search for anticlines as a reversal from the normal dip in an era plainly indicates their presence. The reflection seismograph and gravimeter also pick up anticlines easily so that these structures may be considered among the easiest to find. For this reason, it is not to be anticipated that many remain to be found in established productive areas. Here the search for oil must be directed toward more obscure areas. In virgin territory, however, anticlines are the first structures to be sought.

Principal references: Geology of Kettleman Hills, by G. C. Gester and John Galloway, A.A.P.G. Bulletin, Vol. 17, No. 10, and Summary of Operations, California Oil Fields, Vol. 18, No. 4



Above: Structure of Kettleman Hills oil field. Below: Surface geology of area


3'
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Development, Operation and Valuation of Oil and Gas Properties—Part 2

Flow of Homogeneous Fluids Through Linear Systems

By PARK J. JONES
Petroleum Engineer, The Texas Co., Fort Worth, Texas

This is the second in a series of articles being published in The Oil and Gas Journal on the development, operation and valuation of oil and gas properties by the author, Park J. Jones, petroleum engineer, The Texas Co., Fort Worth, Tex.

The first installment appeared in the May 28, 1942, issue and was titled, "Effective Porosity, Specific Permeability and the Geometry of Spacing." The third installment, which is to be published in the issue of June 11, will be titled, "Flow of Homogeneous Fluids Through Radial Systems."

A short biography of the author and a discussion of the scope of the series appeared on Page 33 of the May 28 issue of The Oil and Gas Journal.

1. *Flow of liquids through a linear system of uniform permeability.*—A linear system is one in which the area at right angles to the path of flow is constant. A joint of casing packed with sand is a linear system. If the permeability is uniform throughout a linear system, then, by Equation 1.5.1

$$Q = \frac{1.127\,AK\Delta P}{\mu L} \qquad (1)$$

Where

Q = Rate of flow, bbl./day
A = Cross-sectional area, sq. ft.
K = Specific permeability, darcys
ΔP = Pressure difference between inlet and outlet (P_1—P_2), p.s.i.
μ = Viscosity of liquid, centipoises (= cps)
L = Length of system, feet.

2. *Productivity of a system.*—The productivity, I, of a system equals the rate of production of a specified liquid, or liquid mixtures, for a given pressure reduction. The reduction in pressure is called "drawdown." A system may be a well, lease, or an entire field. Whatever the system may be, at a given time and for a given drawdown,

$$I = \frac{Q}{\Delta P} \qquad (1)$$

Where

Q = Rate of production in bbl./day of a specified liquid or liquids
ΔP = Drawdown or pressure reduction below a given pressure, p.s.i.
I = Productivity, bbl./day/p.s.i. corresponding to the drawdown P.

Variation in well productivities is important in operating oil properties. The value of I usually varies during the life of a well. The individual factors controlling variation in productivity will be considered later.

Example 1.—What is the productivity of the following linear system?

$L = 330'$; $K = 355$ mds.; $\mu = 10$ cps.; $\Delta P = 660$ p.s.i.

$$Q = \frac{1.127 \times 0.355 \times 660}{10 \times 330} = 0.08 \text{ bbl./day/sq. ft.}$$

$$I = \frac{0.08}{660} = 1.21 \times 10^{-4} \text{ bbl./day/sq. ft./p.s.i.}$$

Example 2.—If the porosity in Example 1 is constant and equals 20 per cent and if 30 per cent of the oil in the porous spaces is held motionless, what is the rate of oil advancement and how much time is required to move oil from the inlet to the outlet? What is the pressure distribution?

Volumetric capacity = 0.2/5.614 bbl./cu. ft.

Volume passing through = 0.7 (0.2/5.614) bbl./cu. ft.

Rate of advancement = 0.8 (5.614/0.14) = 3.2 ft./day.

Time elapsed = 330/3.2 = 103.1 days.

The pressure distribution is linear because K and Q are each equal to a constant. On the other hand, if the flow were not viscous, pressure distribution would not be linear.

3. *Flow of liquids through a linear system of variable permeability.*—If the permeability of a linear system is not constant, it is necessary to consider the instantaneous pressure gradients along the path of liquid flow. Denoting permeability distribution by

$$K = \Phi(x)$$

Where

x = Distance from outlet feet

then, as the rate of liquid flow is constant, Equation (2.1.1) may be written

$$Q = \frac{1.127\,A\Delta P}{\mu \int_0^L \frac{dx}{\Phi(x)}} \qquad (1)$$

Example 1.—The specific permeability of a linear system 500 ft. long varies uniformly from 200 mds. at the outlet up to 1,200 mds. at the inlet. If $\mu = 5$ cps. and $\Delta P = 200$ p.s.i. what is the rate of flow, the productivity, and the pressure distribution?

From Fig. 5,

$$\Phi(x) = K = \frac{(100 + x)}{500} \text{ darcys} \qquad (2)$$

$$\int_0^L \frac{dx}{\Phi(x)} = 500 \int_0^{500} \frac{dx}{100 + x} = 500 \log_e 6 = 895.9$$

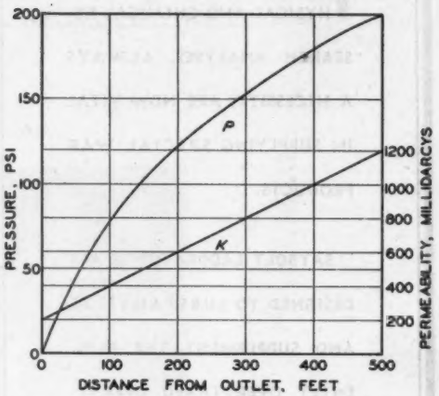

FIG. 5. P AND K DISTRIBUTION IN EXAMPLE 2.3.1.

Accordingly,

$$Q = \frac{1.127 \times 1 \times 200}{5 \times 895.9} = 0.05 \text{ bbl./day/sq. ft.}$$

and

$$I = \frac{0.05}{200} = 2.5 \times 10^{-4} \text{ bbl./day/sq. ft./p.s.i.}$$

Pressure distribution can be mapped out with the aid of the following form of equation (2.3.1)

$$P_x = P_L - \frac{\mu Q}{1.127A} \int_x^L \frac{dx}{\Phi(x)} \qquad (3)$$

In this case, the pressure at $x = 400$ relative to the 200-lb. value of $x = 500$ is given by

$$P_{400} = 200 - \frac{5 \times 0.05}{1.127 \times 1}(500)\ (\log_e \frac{100 + 500}{100 + 400})$$

$$= 179.7 \text{ p.s.i.}$$

and so on for other values of x, see Fig. 5. In this example the pressure distribution is not linear because of the variable permeability even though the flow is viscous.

4. *Flow of natural gases through linear systems of uniform permeability.*—The pressure-volume relationship for gases is usually written

$$PV = ZNRT$$

Where

P = Pressure is p.s.i. abs.
V = Volume in cu. ft. = 379 cu. ft. per lb. mole at 60° F. and 14.7 p.s.i. abs.
N = Number of lb. moles, lb./M
M = Molecular weight in lb.
T = Absolute temperature 460 + °F.
R = Ideal gas constant = PV/T = 14.7 (379/520) = 10.71 for all gases
Z = Compressibility factor.

If a linear system is producing steadily at the rate of Q standard cubic feet per day of a given gas, then the mass rate of flow, Q_m, through any cross-section in the system is constant. Now, as

$$Q = \frac{379}{M} Q_m \text{ standard cu. ft./day} \qquad (1)$$

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the volume rate Q_P flowing through any section in which the pressure is P, temperature T, and compressibility factor Z, is given by the following equation

$$Q_P = \frac{14.7 \times 379TZ}{520M}\left(\frac{Q_m}{P}\right) \text{ cu. ft./day} \quad (2)$$

By Darcy's law, relative to flow rates expressed in cubic feet per day,

$$Q_P = -\frac{1.127 \times 5.614AK}{\mu}\frac{dP}{dx} = \frac{14.7 \times 379TZ}{520M}\frac{Q_m}{P}$$

from which

$$\int_{P_2}^{P_1} PdP = \frac{14.7 \times 379\,\mu LZTQ_m}{1.127 \times 5.61 \times 520\,AKM}$$

or $$P_1^2 - P_2^2 = \frac{2 \times 14.7 \times 379}{1.127 \times 5.614 \times 520}\frac{\mu LTZQ_m}{AKM}$$

or $$P_1^2 - P_2^2 = \frac{3.39\,\mu LTZQ_m}{AKM} \quad (3)$$

or $$Q = \frac{112\,AK(P_1^2 - P_2^2)}{\mu LTZ} \text{ cu. ft./day}$$

provided flow is viscous, and an average value of Z within the pressure limits P_1 and P_2 is used. Equation (3) may be used for determining specific permeability.

5. *Deliverability of any gas system.*—The deliverability D of any gas system may be expressed thus:

$$D = \frac{Q}{(P_1^2 - P_2^2)^n} \quad (1)$$

where

Q = rate of production usually expressed in M.c.f/day
n = exponent, equals unit for viscous-isothermal flow through media of uniform permeability

By the foregoing equation

$$Q = D(P_1^2 - P_2^2)^n \quad (2)$$

Variations of D and n in this equation are important in operating gas properties. Variations in deliverability will be considered later.

Example 1.—How much gas can be forced through a linear system under the following conditions:

L = 1,000 ft.; A = 1; T = 100° F. = 560°; μ = 0.0125; P_1 = 200 lb. per sq. in. abs.; P_2 = 40 lb. per sq. in. abs.; K = 200 md. = 0.2 darcys; Z = 0.98.

$$Q = \frac{112 \times 1 \times 0.2 \times (40{,}000 - 1{,}600)}{0.0125 \times 1{,}000 \times 560 \times 0.98} = 125 \text{ cu. ft./day}$$

$$D = \frac{125}{38{,}400} = 3.25 \times 10^{-6} \text{ M.c.f./day}$$

Reference

1. Muskat, M., "Flow of Homogeneous Fluids," McGraw-Hill Book Co.

Technologists Must Provide Relief From Rubber Shortage

CHICAGO, Ill.—America's acute shortage of rubber must be laid to rubber technologists who have failed to develop practical methods of separating this vital material from plants growing plentifully in our own country, Dr. Thomas Midgley, Jr., vice president of the Ethyl Gasoline Corp., declared at a meeting of the Chicago section of the American Chemical Society May 22, when he received the Willard Gibbs Medal, one of the highest honors in American science.

Striking out at what he termed the "mental slothfulness" of rubber technologists, Dr. Midgley posed seven questions dealing with fundamental aspects of rubber, which cannot now be answered although scientists and technologists have been studying rubber for more than 100 years.

Dr. Midgley's topic was "A Critical Examination of Some Concepts in Rubber Chemistry."

Separation of rubber from the hevea tree, Dr. Midgley stated, is still incomplete and the purest natural product consists of four principal components: sol rubber, gel rubber, resin and a sulfur-free protein.

"Sol and gel rubbers seem to be chemical identities so far as can be determined by chemical analysis, but the difference in physical properties contradicts such a conclusion," he explained. "Sol rubber disperses completely in benzene and similar solvents, gel rubber merely swells; sol rubber vulcanizes to a useful product, gel rubber, to a leathery inelastic product that is quite useless.

"Gel rubber, however, 'breaks down' by mastication in air to give a material quite like sol rubber and which when vulcanized yields a product, in all known respects, the same as that obtained from sol rubber. To fail to differentiate between these two forms of rubber is certain to lead to confusion. "In my opinion much of the confusion which has existed, and still exists, in rubber chemistry is due to a lack of appreciation of this simple fact by many rubber chemists and technologists."

Interest in the chemistry of rubber as a vital link between that industry and petroleum refining makes this discussion of basic properties by Dr. Thomas Midgley, Jr., particularly timely.

Dr. Midgley, vice president of the Ethyl Gasoline Corp. and internationally known for his discovery of tetraethyl lead, received the Willard Gibbs Medal of the Chicago section of the American Chemical Society, one of the highest honors in American science, at Chicago, May 22.

Dr. R. E. Wilson, president of Pan American Petroleum & Transport Co., New York, paid tribute to accomplishments of the medal recipient and the award was made by Harry N. Holmes, national president of the chemical society.

Three of Dr. Midgley's "unanswerable" questions were described as being of technical interest: What happens when rubber is "broken-down," that is, masticated by kneading in air? What happens in vulcanization? Why does rubber retract or shrink after being stretched?

His four other questions, it was pointed out, are primarily of scientific interest, but the answers, if found, may have important bearing on technology of rubber: Are all molecules of sol rubber occurring in nature of the same size or is sol rubber a mixture of molecules of different sizes?

As yet, technologists do not even have pure sol or pure gel rubbers to work with, he continued. If the molecules are all of the same size, what is their molecular weight? What is the structural formula of rubber, that is, how are the atoms assembled that make up its molecules? If

rubber molecules are open chains of atoms, what are the groups of atoms at their ends?

"The detailed chemical reactions which are involved in the breakdown of rubber are not at all understood," Dr. Midgley said, "yet the conditions which produce breakdown and the results have been studied by many investigators with fair agreement.

"It is now over 100 years since Goodyear discovered vulcanization. Broadly speaking, vulcanization is a process whereby a semiuseless vegetal product is converted into the most amazingly versatile raw material the world of industry has ever known.

"And yet, after a century, rubber chemists are in less agreement on the nature of the chemistry of vulcanization than Goodyear's neighbors were that he was crazy. Nor has a hall-of-fame jury yet been selected with brains enough to honor Goodyear's memory as it deserves. It is all most astounding but also is vulcanization.

"If one compares the crude rubber and the finished article, one will notice that many physical properties are remarkably alike, qualitatively, though enhanced quantitatively in the vulcanizate. Naturally, this suggests that vulcanization is reversed breakdown. Therefore, if breakdown is the result of molecular ruptures, it logically follows that vulcanization must be molecular building up by polymerization or condensation. This indeed is a very easy conception to visualize. It gives an explanation of the part played by sulfur: simply that the sulfur atom connects two rubber molecules by joining to each of them by primary valences.

"The simplicity of this broad concept has won many converts; too many, for it has one grave error. There is not one single piece of sound evidence that it is so, and many contradictory ones. In the first place, vulcanization is not breakdown in reverse, except in a very superficial way. Incipient and then progressive vulcanizates do not show the regular steps of increasing viscosity and decreasing solubility that would be expected; nor can a vulcanizate be obtained that gives quantitative properties corresponding to those of unbrokendown rubber.

"Consider both breakdown and vulcanization from a different point of view. Instead of assuming that unbrokendown rubber is elastic, with fair tensile strength, because its molecules are long and that brokendown rubber is plastic because its molecules are short, assume that the difference in plastic properties of unbroken and brokendown rubber is caused by a difference in the ease with which the molecules slip past each other under stress.

"True, this difference may be the result of different lengths of molecules, or it may be that in brokendown rubber a few small molecules act as lubricants for the larger ones quite the same as a small amount of lubricating oil in unbrokendown rubber will give a plasticizing effect. This concept does not require the rebuilding of large molecules out of small ones to account for the change that is called vulcanization. Any procedure which results in reduced slipping will accomplish a change of this sort; witness the loading effect of carbon black or zinc oxide.

"The retraction of rubber, that is, the property which causes rubber to return to its original shape and size with force after being stretched, is the outstanding characteristic that distinguishes it from chewing gum, bees wax, and tar and makes it into the useful material that it is. The study of this property really falls in the field of physics rather than chemistry, but its importance justifies its inclusion in any discussion of rubber or rubber chemistry. Indeed, this property is so important that any material which possesses it can be called a rubber, no matter what its chemical constitution may be.

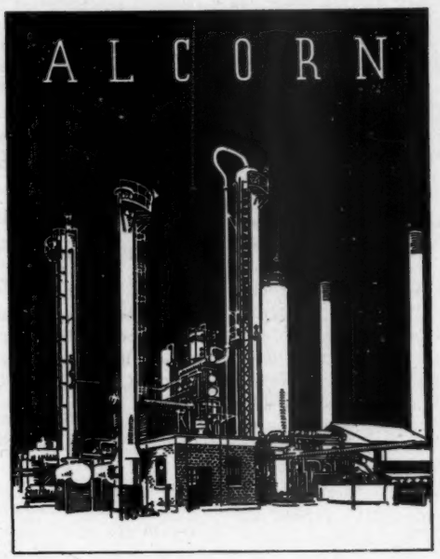
"Some 20 odd years ago, after Staudinger announced the long chain structural formula, opinion began taking shape that the extension and retraction of rubber was simply an integration of the behavior of the component molecules. In other words, it was assumed the rubber molecule itself is subject to extension and exhibits forceful retraction thereafter.

"This concept has steadily gained ground. It is true that no direct evidence exists to confirm this concept and by its very nature it may well be that there never will be any, but on the other hand no contradictory evidence exists, which very well could, were this concept in great error. So that until some such evidence is obtained, or a concept developed which fits the facts more accurately, this concept should be accepted as the nearest approach to the truth that is available.

"Two explanations have been offered. One by Shecklock, with later variations by others, based on thermal and thermodynamic considerations, and one by Mack, who makes use of Van der Waals forces, applied to scale models. I am incompetent to differentiate critically between these two. Each of them fits certain observed data better than the other, but Mack's concept appeals more strongly to me, as it is based more closely in the fields of rubber chemistry with which I am familiar, and it predicts, quite well, the behavior of rubberlike and related substances of known composition, structure and isomerism. Its extension might be very useful in predicting new molecular forms which could lead to better and less expensive synthetic rubbers than we now have.

"I am not qualified to criticize either of the above theories, but I do feel qualified to criticize both rubber chemistry and chemists for not having mastered either of them more thoroughly. That they are difficult to master is no excuse, for the rubber chemist, who expects to serve humanity well, must be prepared to master things more difficult than either of these theories."

ALCORN



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QUESTIONS ON TECHNOLOGY

Simplified Flow Diagrams

Hydroflouric Acid Alkylation

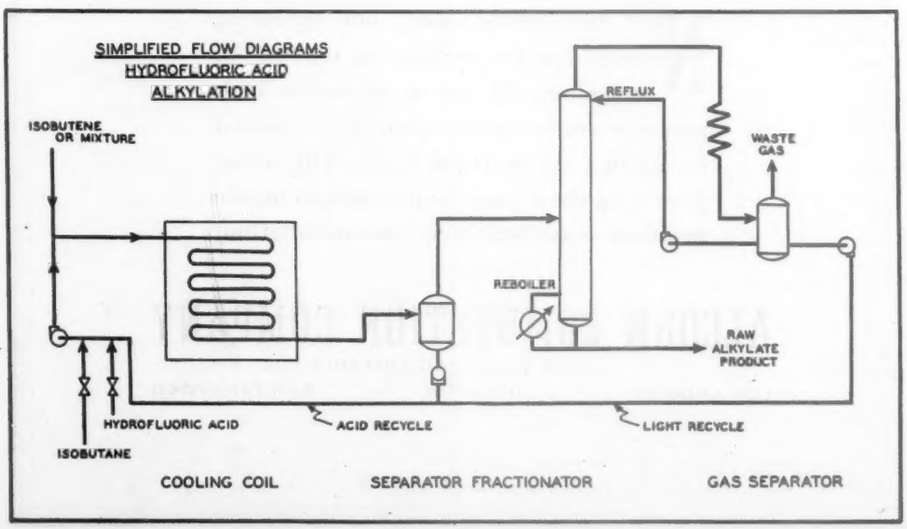
We hear of the hydroflouric alkylation process but cannot find out much about it. Can you give us any information?—J. C. S.

Not much has been disclosed about this process but the original patent of Grosse & Linn (U. S. Patent 2267730—December 30, 1941) is available and it is possible to draw certain general comparisons with other alkylation processes. A simplified flow diagram of the process is shown on this page.

The process accomplishes the connection of branched chain or isoparaffin hydrocarbons to monoolefinic hydrocarbons by the use of a hydroflouric acid as a catalyst. The process is applied primarily to mixtures of isobutane and isobutene for the production of mixtures of branched chain isooctanes (alkylates) of which 2,2,4-trimethyl pentane having an octane number of 100 is an example. Anhydrous hydrogen flouride (hydroflouric acid) is recycled in the process, being mixed with about equal parts of isoparaffin and monoolefin hydrocarbon, and the hydrocarbon products are separated by stratification. The temperature and the time for reaction is controlled by means of a cooling coil, and the tendency toward polymerization is controlled by using a larger amount of isobutene than isobutane in the mixture. Although reaction temperatures up to 90° or 100° C. can be used, these high temperatures tend to produce heavy or high-boiling alkylates. Reaction proceeds well at 20°-30° C. but little alkylation occurs at minus 50° C. A yield of 65 per cent of alkylate (about half 2,2,4-trimethyl pentane) is produced in a single pass (or reaction) when using a 3:1 ratio of isobutane to isobutene and a reaction temperature of 20°-30° C. It would be inferred from this statement of yield that final yields of alkylate exceeding 90 per cent would not be unreasonable. The main loss appears to be by the formation of alkyl flourides, but these can be decomposed by passing the alkyl flourides over granulated calcium or aluminum flourides which decomposes the alkyl flourides into the corresponding olefins and hydroflouric acid.

The hydrocarbon product is fractionated into unreacted low-boiling hydrocarbons which pass overhead from the fractionator and may be recycled, and into raw alkylate bottoms. Presumably it is necessary to redistill the raw alkylate for the removal of high-boiling reaction products known as heavy alkylate, or possibly the reaction can be controlled by recycling in such a way that a suitable minimum of high-boiling alkylate can be produced.

A primary advantage of the process is the fact that propylene and pentenes can be used as a part of charge stock. Butanes and butenes are now scarce and hence the substitution of the above olefin hydrocarbons in place of butenes is of vital importance in our war effort.



Value of High-Octane Blending Stocks

How can we determine the value of a high-octane blending agent which is used to mix with our motor gasoline stocks? How much is this stock worth to us because of its ability to raise the octane number of our poor octane gasoline?—F. G. W.

Barring extraneous factors such as those introduced by stocks which are undesirable because of sulfuric content, gum content, color, etc., the general relationship between octane numbers, blending values (blending octane number), lead susceptibility of the stocks, and the cost of tetraethyl lead, can be derived as follows:

The cost of improving the octane numbers of the base (low-octane) stock from its original clear octane number up to a higher desirable octane number (such as that of *Q* gasoline) can be expressed as:

$$\text{Cost of improving octane number of base stock} = Lc$$

in which

L = cc. of TEL fluid required to raise the octane number of the base stock to the desired octane number
c = cost of TEL fluid mixed in gasoline, ct. /cc.

The gallons of high-octane blending agent that must be mixed with 1 gal. of base stock in order to raise its octane number by the same amount, is also worth Lc more than the sale value of the blend, and hence it is necessary to compute how much high-octane stock must be used for each gallon of low-octane base stock.

$$O = O'_B B + Os\ (1\text{-}B)$$

$$B = \frac{O - Os}{O'_B - Os}$$

in which

B = fraction of high-octane stock in final blend
O = octane number of final blend
O'_B = octane number (blending) of high-octane stock
Os = octane number of low-octane or base stock

The gallons of high-octane stock per 1 gal. of base stock is:

$$\frac{(O - Os)}{(O_B' - Os)} \div \left(1 - \frac{O - Os}{O_B' - Os}\right) = \frac{O - Os}{O_B' - O}$$

The extra value of the high-octane stock in excess of its sales value in the final blend is:

$$\frac{Lc}{\dfrac{O - Os}{O_B' - O}} = Lc\,\frac{O_B' - O}{O - Os}$$

And the actual value of the high-octane agent in cts./gal. is:

$$V = v + Lc\,\frac{O_B' - O}{O - Os}$$

in which

V = value of high-octane agent, cts./gal.
v = value of final blend, cts./gal.

The equation presumes that high-octane agent will be used alone to replace the lead fluid that has previously been used. Thus, if not only blending agent but also TEL must be used, the equation may not be perfect, erring in case the lead susceptibility of the high-octane agent or blend containing it, is not the same as the lead susceptibility of the base-stock material in a comparable octane-number range. Such a situation is so complicated that a mathematical statement of it would be of doubtful value.

Additional School Work in Petroleum Refining

On the Questions on Technology page of December 11, 1941, about 26 universities, colleges, etc., that give subjects in petroleum refining or engineering, were listed. Since that time, another school has come to the attention of The Oil and Gas Journal, and information about this school is given below:

Illinois Institute of Technology, Chicago, Ill., about 8 credits:

Ch.E. Petroleum Refining and Hydrocarbon Technology; Ch.E. Cracking of Petroleum; Chem. Chemistry of Petroleum Hydrocarbons.

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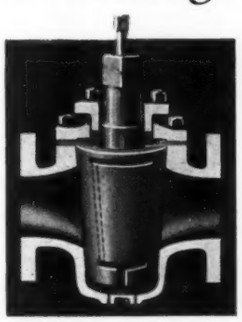

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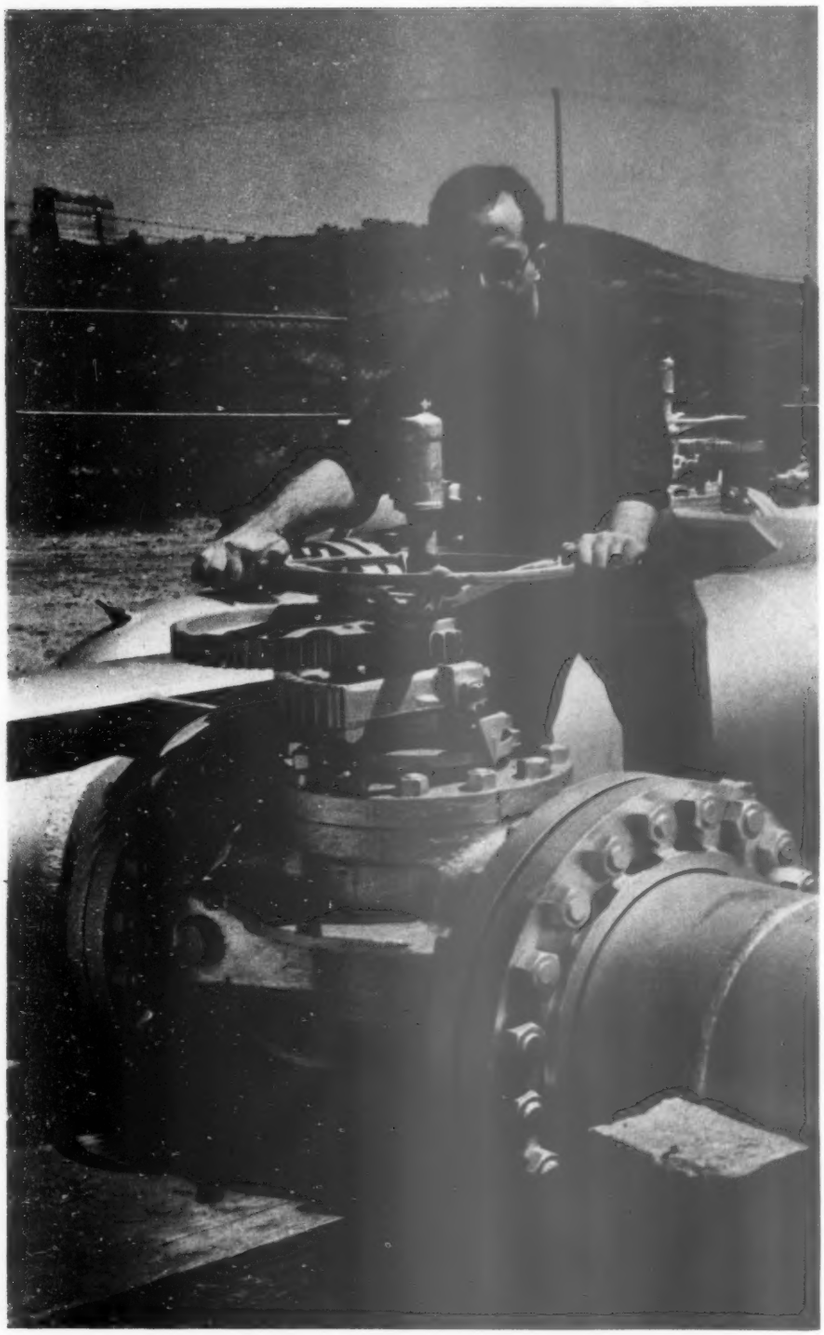

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CO$T Engineering

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

EVALUATION

JUNE 4, 1942

EVALUATION OF PROPERTY MUST INCLUDE ALL FACTORS

WHEN estimating the cost of a particular piece of oil-producing property being considered for purchase, it is not only necessary to make a prediction on the amount of oil remaining in place but it is also necessary to take into account other factors. Mainly these are any indebtedness against the property, which must be assumed by the purchaser, the price to be received for the production, operating costs, and the actual present worth of the income to be obtained. Three of these can only be estimated, so that the present worth must also be an estimate even though apparently exactly determined.

One of the factors frequently overlooked is the time required to obtain the production. A property of inferior productivity in an unrestricted area may be more valuable than a good property which is hampered by legal restrictions as the former may produce its oil, and hence return the money to the purchaser, much faster than the latter.

The present value of the amount to be received each year can be obtained by the familiar formula:

$$S = \frac{P}{(1+r)^n} \qquad (1)$$

Where

S = present value
P = amount of money
R = interest rate compounded annually
n = number of years

If the interest is compounded semi-annually, the formula becomes

$$S = \frac{P}{(1+\frac{r}{2})^{2n}} \qquad (2)$$

Thus if the amount of money to be received from a property at the end of 5 years amounts to $10,000 the present value at 6 per cent is by (1)

$$\frac{\$10,000}{(1.06)^5} = \$7,462$$

In view of the variation in properties, it would actually be unsound to use 6 per cent in all cases. Actually from 8 to 10 per cent would be much sounder basis.

The accompanying tables show the calculation on one property. The estimated future production was obtained by averaging the results secured by employing several methods of figuring the reserves. Average price is estimated at $1.21 per barrel and lifting costs and salvage value are likewise estimated.

The income from the property is estimated for the balance of the year in which the work was done through the next succeeding 5 years. The situation was complicated by oil payments which called for $9,900 out of one-eighth of the working interest and $50,000 out of three-sixteenths of the working interest followed by $200,000 out of one-fourth of the working interest. These oil payments expire at the end of the fourth year but the amount to be paid out in each year preceding that time must be calculated on the basis of annual production.

After making the necessary deductions the estimated income is placed at $285,231, while the present value is only $249,663, to which must be added the present worth of the salvage to arrive at the total present value, or worth.

The purchase price to be offered was then found by multiplying the total present worth by 60 per cent, the risks in this case being rather high. Had the risks been lower, the price offered would have been 70 per cent of the net value.

TABLE 1

Estimated future production, bbl.	408,291
Less ⅛ royalty, bbl.	51,036
Working interest, bbl.	357,253
Estimated average price, bbl.	$1.21
Estimated value, working interest	$432,279
Estimated lifting costs	56,272
Net income	376,007
Estimated salvage	21,000
Total net income	397,007

TABLE 2

Year ending	1941	1942	1943	1944	1945	1946
Production, bbl.	120,291	96,000	72,000	56,000	40,000	24,000
Royalty, bbl.	15,036	12,000	9,000	7,000	5,000	3,000
Working interest, bbl.	105,255	84,000	63,000	49,000	35,000	21,000
Value at $1.21	$127,359	$101,640	$76,230	$59,290	$42,350	$25,410
Est. lifting cost/bbl.	.11	.12½	.14	.16	.18	.20
Operating expense	13,232	12,000	10,080	8,960	7,200	4,800
Net property income	114,127	189,640	66,150	50,330	35,150	20,610
Less oil payments	37,998	25,410	19,048	8,321	.....	.....
Net income	76,129	64,230	47,102	42,009	35,150	20,610
Present worth	73,920	58,836	40,698	34,236	27,030	14,943

TABLE 3

Estimated income	$285,231
Present worth	249,663
Estimated value of salvage	21,000
Present worth	15,215
Total present worth	264,888

Estimated value for purchase based at 60 to 70 per cent of expected income is $158,934 or $185,420.

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Engineering Fundamentals

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL No. 19

JUNE 4, 1942

GAS FLOW IN LOOP SYSTEMS

IN order to increase the capacity of a pipe-line system already installed, another line, not necessarily of the same diameter, may be laid alongside the original line for any or all of its length. When a line already installed is found to have insufficient capacity, the laying of a loop is usually the most economical means of increasing the capacity.

Although the new line may often be laid alongside the original one, this is not always the case. Thus, the two or more branches of a loop are not always the same length.

The term "loop" as used in this discussion will refer only to that part of a pipe-line system where two or more lines have a common point of origin and a common terminus. Although it is rather uncommon to find a loop composed of more than two branches, the calculation can be handled just as well with a loop of several branches as with a loop of two branches.

Calculations dealing with loops can be most easily handled by determining the length and diameter of some simple pipe line that would be equivalent to the loop. Using this simple line, substitution is made in the original form of Weymouth's equation, given in Installment 17 of this series. By an equivalent line is meant a line of such length and diameter that it would produce the same pressure drop when allowing the same rate of flow of the same gas under the same conditions as the actual system.

By considering all of the points mentioned in the definition of equivalent line given above, the following formula can be derived for use in arriving at an equivalent line for a loop:

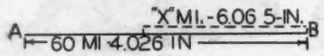
$$\frac{d_e^{2.667}}{\sqrt{L_e}} = \frac{d_1^{2.667}}{\sqrt{L_1}} + \frac{d_2^{2.667}}{\sqrt{L_2}} + \ldots + \frac{d_n^{2.667}}{\sqrt{L_n}} \quad (1)$$

Where

d_e = diameter of equivalent line, inches.
L_e = length of equivalent line, miles.
$d_1, d_2, \ldots, d_n$ = diameters of the various branches of the loop, inches.
$L_1, L_2, \ldots, L_n$ = lengths of the various branches of the loop, miles.

The determination of the equivalent line is accomplished usually by arbitrarily choosing a diameter for the equivalent line and then calculating the length of the equivalent line using the formula given above. In some cases a better method consists of choosing some arbitrary length for the equivalent line and calculating the corresponding equivalent diameter.

Example 1.



Problem.—Given the following data for the loop shown in the sketch:

Pressure at A = 500 lb. per sq. in. abs.
Pressure at B = 100 lb. per sq. in. abs.
Specific gravity of gas = 0.67.
Flowing temperature = 60° F.
Calculate the rate of gas flow that can be expected from A to B.

Solution.—Calculate the equivalent length of the loop in 4.026-in. pipe by substitution in Equation 1.

$$\frac{4.026^{2.667}}{\sqrt{L_e}} = \frac{4.026^{2.667}}{\sqrt{10}} + \frac{3.068^{2.667}}{\sqrt{12}}$$

Using Table 1, Installment 17 for values of $d^{2.667}$,

$$\frac{41}{\sqrt{L_e}} = \frac{41}{\sqrt{10}} + \frac{19.9}{\sqrt{12}} = 12.97 + 5.75 = 18.72$$

$\sqrt{L_e} = 41/18.72 = 2.19$, or $L_e = 4.8$ miles.

The loop, then, is equivalent to 4.8 miles of 4.026-in. line.

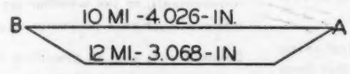
Substituting in Weymouth's formula for a simple line,

$$Q_s = 15{,}302 \times 41 \times \left[\frac{(500)^2 - (100)^2}{4.8 \times 0.67 \times (460 + 60)}\right]^{1/2}$$

Solving,

Q_s = 7,520,000 standard cu. ft. per 24 hr.

Example 2.



Problem.—A company is operating a 4-in. pipe line (4.026-in. i.d.) delivering gas from point A to point B. Due to an increased demand for gas at point B, it is desired to increase the capacity to 150 per cent of the present amount by looping the present line with 6-in. pipe (6.065-in. i.d.). The 6-in. pipe is to be laid alongside the 4-in. pipe. Calculate the number of miles of 6-in. pipe required.

Solution:

Let Q_1 = present capacity of the system, and Q_2 = capacity after looping is completed. It is desired that $Q_2/Q_1 = 1.5$.

Now, in solving the problem, it is convenient to consider the length of the original system as compared to the equivalent length of the looped system in terms of 4-in. pipe.

For any two pipe-line systems where all the other factors in Weymouth's formula are the same, it can be shown that the ratio of the capacities are equal to the inverse ratio of the square roots of the lengths.

Then, for this problem,

$$\frac{Q_2}{Q_1} = \sqrt{\frac{L_1}{L_2}} = 1.5$$

or

$$L_1/L_2 = 2.25$$

and since L_1 = 60 miles,

L_2 = 60/2.25, or 26.67 miles of 4-in

The looped system then must be equivalent to 26.67 miles of 4-in. pipe.

Now, calculate the number of miles of 4-in. that are equivalent to 1 mile of loop, as follows:

$$\frac{4.026^{2.667}}{\sqrt{L_e}} = \frac{4.026^{2.667}}{1} + \frac{6.065^{2.667}}{1}$$

Using Table 1, Installment 17, for values of $d^{2.667}$,

$$\frac{41}{\sqrt{L_e}} = 41 + 122.4 = 163.4$$

$$L_e = \left(\frac{41}{163.4}\right)^2 = 0.063 \text{ miles of loop}$$

Then, let x = miles of loop required, and write an equation based on the premise that the equivalent length of the entire loop, in terms of 4-in. pipe, plus the remaining length of 4-in. not looped must equal the 26.67 miles of 4-in. calculated above,

This equation is,

$$0.063\,x + (60 - x) = 26.65$$

Solving,

$$x = 35.75 \text{ miles.}$$

Then the length of the loop must be 35.75 miles, which is also the length of 6-in. pipe required.

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma

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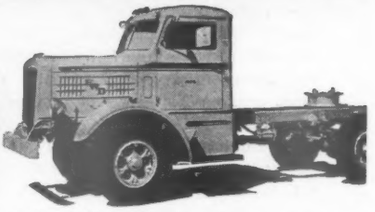
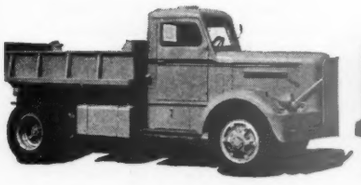
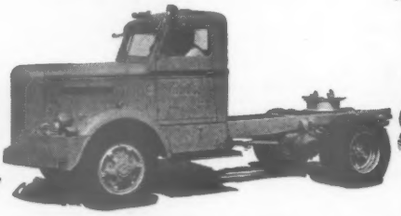


FWD Model — CU: Gross vehicle weight 22,000 lbs., 106 H.P. engine, 5 speed transmission, single reduction axles equipped with 10:00x20 dual tires, pintle hooks and manual radiator shutters.

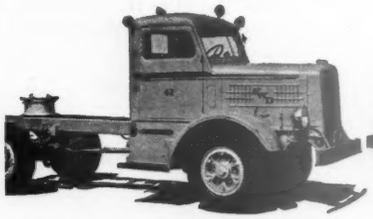


FWD Model — HR: Gross vehicle weight 20,000 lbs., 98 H.P. engine, 5 speed transmission, auxiliary gas tank on side of frame, 144 inch wheel base, 9:00x20 dual tires.

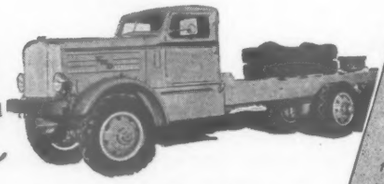


FWD Model — HG: For underbody scraper use, 106 H.P. engine, 14 inch clutch, 5 speed transmission, 8:25x20 dual tires, extra heavy straight frame, coupe type cab.

FWD Model HA (COE): Gross vehicle weight 17,000 lbs., 95 H.P. engine, 5 speed transmission, boring machine, utility body, winch and derrick, 8:25x20 dual tires.



FWD Model—YU: Gross vehicle weight 26,000 lbs., 150 inch wheel base, 11:00x20 dual tires, 5 speed transmission, V snowplow with two wings and two 35 gallon gasoline tanks.



FWD Model MJ 6x6: Six wheel drive, gross vehicle weight 45,000 lbs., 126 H.P. engine, 10 speed transmission, double reduction axles, 11:00x20 dual tires, 204 inch wheel base, air brakes, chassis weight 18,000 lbs.

PRESENT FWD OWNERS

Attention!

If for any reason you are not making full use of your FWD trucks and would like to make them available to others, engaged in vital war work, please notify us and we will be glad to put you in touch with qualified buyers who have immediate need for used FWD trucks.

THE FWD trucks illustrated above, all of them new and modern in every respect, are held in our "pool" subject to government rationing regulations under General Conservation Order M-100, effective since March 9, 1942.

In a spirit of cooperation with the rationing authorities, we are interested in seeing that these FWD trucks promptly go to truck users who can establish the greatest need for them in conjunction with the national war effort.

In addition to the trucks described above, we have other trucks available for immediate delivery under the rationing regulations. If you are interested in four-wheel-drive truck equipment, we invite you to write or wire us, stating your requirements, to see whether we have a truck in stock to meet your particular needs.

Communicate with us directly or the nearest FWD authorized dealer for full information both as to trucks available and your eligibility to purchase under the rationing regulations.

THE FOUR WHEEL DRIVE AUTO CO., Clintonville, Wis.
Canadian Factory: KITCHENER, ONTARIO

FWD TRUCKS

Journalog

A BIWEEKLY FEATURE OF THE OIL AND GAS JOURNAL

No. 7

JUNE 4, 1942

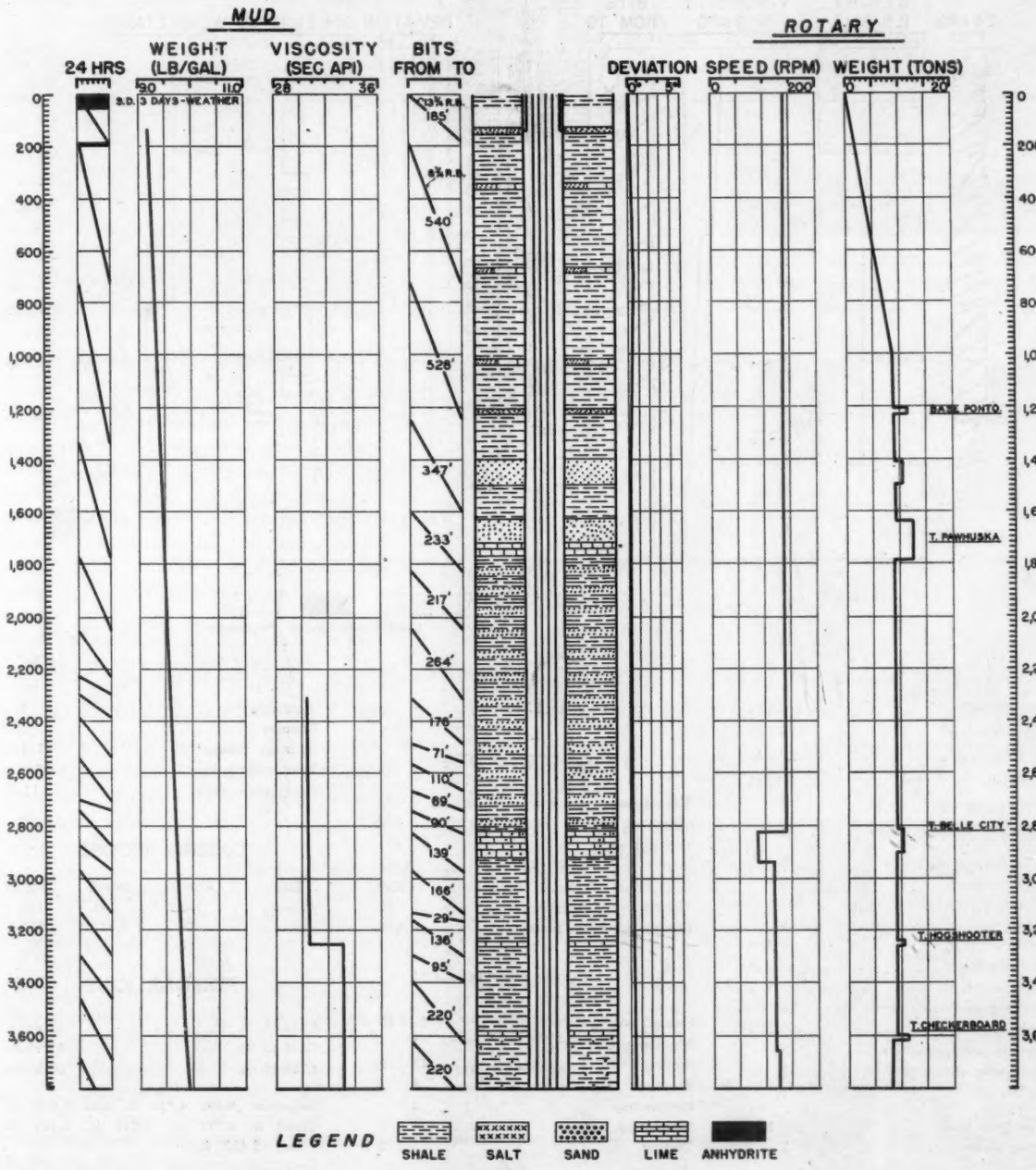
CITIES SERVICE and ATLANTIC 1 FORT COBB

SW NE NE 4-8n-3e

ARROW DRILLING CO.

CONTRACTOR

Discovery Well, Brooksville Pool, Pottawatomie County, Oklahoma



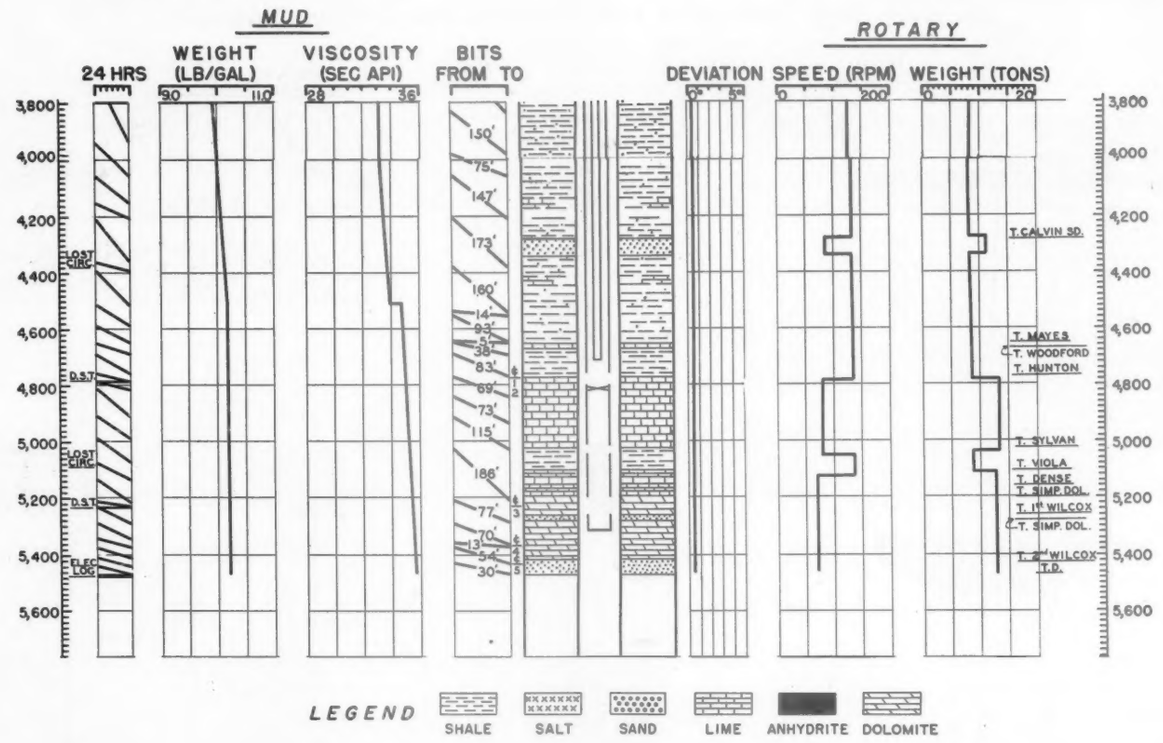
(Continued on Next Page)

Journalog

A BIWEEKLY FEATURE OF THE OIL AND GAS JOURNAL

JUNE 4, 1942

Discovery Well, Brooksville Pool, Pottawatomie County, Oklahoma (continued)



Date started	12-18-41
Drilling started	12-25-41
Pay string set	2-10-42
Completed	3-11-42
Days rigging up	4
Total days drilling rotary	47
S.D. repairs	5 1/2
S.D. weather	3
W.O.C.	2
Trips	6
Tests	1 1/6
Miscellaneous	1/2
Electric log	1/2
Waiting and circulating	4
Reaming	2/3
Casing, cementing, etc.	1
Regaining circulation	1
Coring	1
Net drilling time	21 2/3
Tearing down rotary	2

Ran electric log at 5,465 ft.

PRODUCTION TEST

Time flowed, hours	19
Choke on tubing, inch	1/4
Oil, barrels	671
Water	None
Gravity of oil (cor.), °A.P.I.	33.6
Tubing pressure, pounds	90
Casing pressure, pounds	600

COMPLETION

Started cable tools	2-13-42
Rigging up, days	1
Bailing	12 1/2
Waiting	8
Perforating	1
Cementing back	2/3
Testing	1/3
Acidizing	1/2
Repairs	1/2
Running tubing	1 1/2
Total completion	25
Completion depth	3-11-42

CASING RECORD

Size—	Weight	Depth	Cement
10¾-in.		142	140
7-in.	24	5,317	528

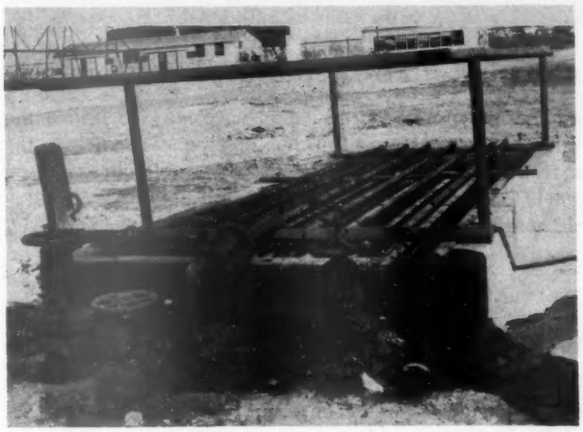
PERFORATIONS

5,210-45 ft.	37 shots
5,110-45 ft.	36 shots
4,759-87 ft.	59 shots

Drill-stem tests, 4,785 ft. and 5,230 ft.
Cored at 4,773 ft., 5,230 ft., 5,367 ft. and 5,430 ft.

Refinery IDEAS

. . . that save $ $ $



Temperature of Asphalt Controlled at Pit

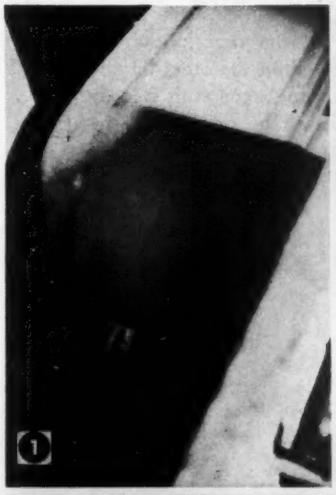
Blown asphalt, made in the refinery and ready to be sacked, can be most quickly handled and accurately gaged if its temperature is held within a narrow range. This is accomplished in one plant by pumping the molten material from the still through a coil suspended in an open concrete pit. Here the asphalt coil is located between an overhead, perforated water coil and a series of gas burners below. If the material is too hot, the water spray is used and if too thick the burners are used.

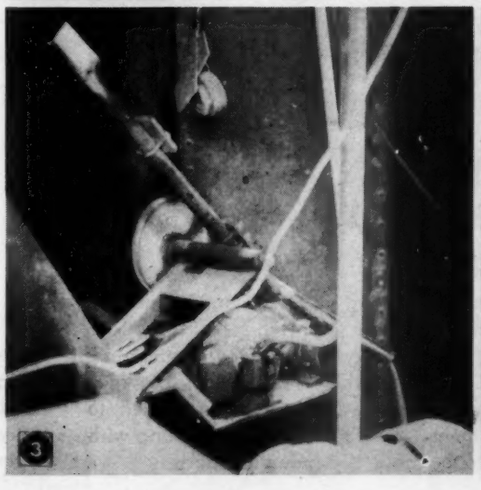
Samples of Fuller's Earth Taken Continuously to Gain Accuracy →

The sampling of fuller's earth taken from oil filters and from the burners calls for selecting a representative cross section of a large mass. To take such a sample requires the segregation of small portions of the earth at regular intervals. Refiners use various methods. Here are shown two means, either one of which will yield a representative sample. In (1) is pictured a short flat arm that sets at a short distance from the earth-conveyor belt and removes a slight portion of the earth as the belt conveys the earth past the arm. In this installation, the portion of earth removed by the arm falls through a screen and onto a screw conveyor which in turn carries the earth to the bucket shown in (2). In (3) another type of sampling device is shown. Here an arm is raised and lowered by means of an electric motor. The arm is fastened to a reduction gear and lever which causes the arm to be slowly raised and lowered. In (3) the chute is shown at the extreme left. The cup end of the arm is raised and the sample may be seen falling from the opposite end into a pail. In order to reduce the accumulated sample it is run through the divider shown in (4).

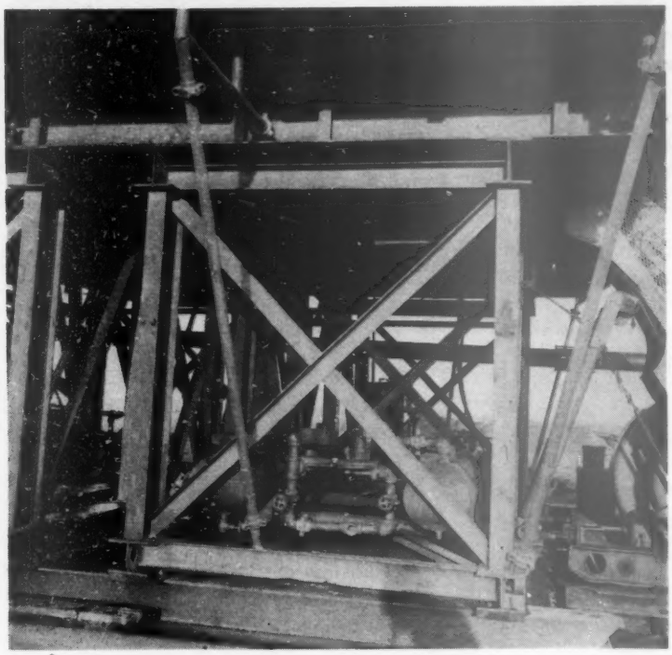
Fire-Fighting Equipment Placed Throughout Yard

Recognizing the advantage of distributing the fire-fighting equipment throughout the refinery, foam and water-dispensing units are being housed in many ways. Here the hose and nozzles of a water system are kept in a wooden structure built over a hydrant. The building is hexagonal and one-half of the structure opens readily when tthe hydrant is to be used. The hose remains connected, in a convenient coil, and is protected against the weather. Quick-opening valves have been placed in the system and the one serving the hose in place is left open so that the master valve will control the water flow at the start of the fire. As other lines are attached, the individual valves are opened.



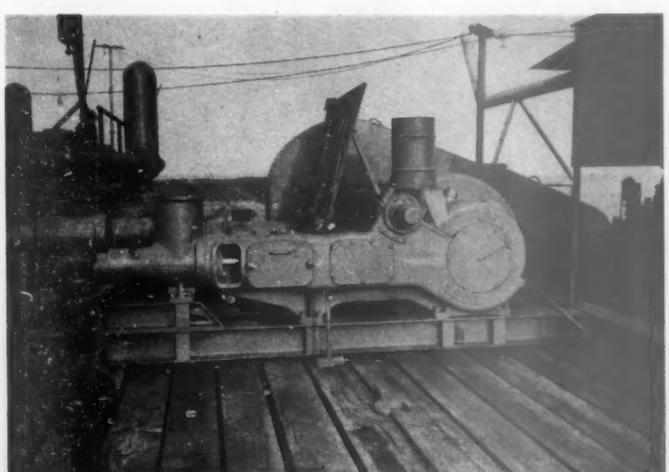


Operating Ideas



Gas Regulators in Engine Substructure

Some California companies with heavy steam rigs follow the practice of mounting the steam separator within the steel engine substructure. A California company drilling in Texas with a large rig powered by natural-gas engines modifies the practice by installing permanently all gas regulators and volume tanks in the engine substructure, saving connection work when rig is moved.



Tool Racks For Each Unit

Much time and effort often are consumed by crew members around a drilling rig in gathering tools and returning them to their proper places. To reduce this tool-carrying factor to a minimum, a large operator in the Slaughter field, West Texas, provides racks at each major equipment unit where the tools related to that unit can be kept at all times. Here is shown a mud pump with all pump tools in place on a permanently mounted rack.

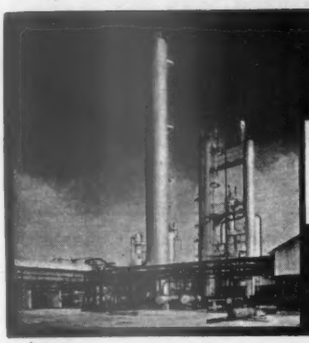
Portable Grinder For Repairing Tool Joints

After building up worn tool joints it is necessary to reface the shoulders for proper makeup of strings of pipe. On a job in the field, this refacing is being done with a portable motor-driven emery wheel. Power is supplied from a small generator included in the field servicing equipment.

Counterbalanced Wheel Supports Steam Hose

To keep steam hoses on a drilling rig out of the way and safe from abuse and unnecessary wear when not in use, an operator in a West Texas field has devised the counterbalanced hanger shown in the accompanying picture. When the hose is necessary

only a little force is needed to draw it to any point about the slush pumps and mud tanks. The sheave wheel, which suspends the hose and which is connected to the counterbalance by a short piece of cable passing through a pulley, is sufficiently large that it cannot kink the hose too sharply.



REFINERY ACTIVITY AND EXPANSION

Appropriation for Coal Hydrogenation Approved

PITTSBURGH, Pa.—An appropriation of $85,000 has been included in the Bureau of Mines budget for construction of a plant at the experiment station here for production of gasoline from coal. Much of the bureau's previous experimental work with hydrogenation of coal for the production of motor fuels and burning oils has been conducted at the Pittsburgh station.

The Pittsburgh plant will have capacity of 100 lb. of gasoline daily. Research will be conducted by the Fischer-Tropsch hydrogenation process.

Socony-Vacuum Doubling Aviation-Gasoline Capacity

NEW YORK.—Construction is now under way at eight of Socony-Vacuum Oil Co., Inc.'s refineries that will approximate double the company's production of aviation gasoline, John A. Brown, president, told stockholders at the annual meeting here May 28.

The construction program will cost about $27,400,000. The company is supplying $13,400,000 of the necessary financing and the rest is loaned by the Government.

"We are also building a plant in Texas at government cost," Mr. Brown said, "to extract toluene from petroleum for use in making TNT explosive."

Company engineers, Mr. Brown told the stockholders, have developed a catalytic cracking process known as Thermofor which technicians believe will save considerable material and cost for plant construction. (See related story on Thermofor process on pp. 44 and 45.)

"We are constructing a 20,000-bbl. per day unit at one of our refineries to be in operation within a year and have authorized two units at other refineries," Mr. Brown said.

"In the manufacture of synthetic rubber," he added, "Socony-Vacuum is one of five companies which have formed a corporation called Neches Butane Products Co. to erect and operate a plant in Texas for the production of butadiene from petroleum. This plant is planned to have a capacity of 10,000 short tons of butadiene a year. This is sufficient, when combined with other necessary ingredients, to provide for the manufacture of 100,000 long tons of raw synthetic rubber."

Deliveries of Aromatics Restricted by War Board

WASHINGTON, D. C.—An order limiting deliveries of aromatic petroleum solvents to transactions bearing high preference ratings was issued last week by the War Production Board for the purpose of increasing the production of aviation gasoline and nitration-grade toluene.

Aromatics, normally used chiefly in paint and other protective coatings, are now tolerated to a limited extent in aviation gasoline specification AN-VV-F-786, which became effective in March.

The order (M-150), effective May 25, is designed to divert more than 50 per cent of the two principal aromatic constituents of petroleum solvents—toluene and xylols—from use in the protective coating field to the more important production of aviation gasoline and nitration toluene.

Principal provisions of the order follow:

1. Deliveries may be made only to fill orders to which certain preference ratings have been assigned. During the period June 4 to June 14, the required rating is A-10; beginning June 15, the required rating is A-2. A person purchasing solvents for resale without physical or chemical change is not required to show a rated use.

2. A purchaser, other than a person buying for resale, is required to attach to the order a certification showing the purposes for which the solvents are to be used.

3. Each producer of solvents must accumulate before July 1, or as soon thereafter as possible, a minimum inventory amounting to not less than 25 per cent of his average monthly production of each solvent produced during the first 4 months of 1942. This reserve stock will be held for distribution by the director of industry operations in emergency situations. To the extent that withdrawals from the pool are ordered by the WPB, a producer must replenish the reserve at a rate of not more than 5 per cent of average daily production.

4. After making deliveries on rated orders and setting aside the inventory stock, each producer must divert his remaining supply of solvents, whether in the form of finished product, intermediate fraction, or crude petroleum, to the production of nitration toluene or aviation gasoline as ordered by the director of industry operations. The aviation gasoline so produced must be delivered solely in fulfillment of contracts or subcontracts of the Army or Navy.

5. No person is to use the solvents for any purpose if suitable substitutes are available.

6. Solvents may not be received by any producer or distributor if the delivery would result in a supply in excess of 30 days' needs.

Sketches of Plant Operators . . .

DANA W. HOVEY, vice president and general manager of Republic Oil Refining Co., Duval Gasoline Co., Duval Pipe Line Co., and president of the Gulf Coast Refiners Association, has a hobby. It's his job.

Mr. Hovey is one of those hard-working, sincere, fact-finding executives who is moved only by results. His record of expanding the company's modern refinery at Texas City from a 5,000-bbl.-per-day plant a relatively few years ago to 20,000 bbl. per day is typical. And he now has up for continued study probably the most involved construction program in the refinery's history. This helps to account for Mr. Hovey's frequent visits in the earlier part of the year to Washington where the processing plans were correlated with the industry's war effort.

Lately Mr. Hovey's moves have been cramped a little by his not being able to go just where he has wanted to go as fast as he is used to going. Mr. Hovey is a licensed pilot and has not hesitated to fly to the home offices of the Benedum-Trees interests in Pittsburgh, to any one of the company's scattered properties in Texas, from Corpus Christi to the Panhandle, or to Washington, as the need arose. But the federal Government stopped all this when it called for Mr. Hovey's plane for military use. Like many other refinery executives, Mr. Hovey must do about the same thing by some other means. In the 30 years of oil experience since joining Standard Oil Co. of New York in 1911, later working as a junior executive in the Waverly Oil Works and then building the Republic plant at Texas City to its present importance, the efforts and accomplishments of Dana W. Hovey have been founded upon work and a close scrutiny of realities.

Why shouldn't it be faster!
This ELLIOTT
Lagonda Type
Tube Cleaner
has
DOUBLE
BALL THRUST BEARINGS
Practically all the power you put into this free-running tube cleaner goes into smashing coke — none of it wasted in overcoming thrust friction. Of course it does a faster job, stands up longer, saves hours of still down time. Check on this with our nearest field office, or write us.
There's an Elliott-Lagonda Tube Cleaner for every refinery tube and pipe.
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SPRINGFIELD, OHIO
District Offices in Principal Cities

WHO'S WHO IN REFINING

The Texas Co.

TWENTY-ONE refineries scattered through 11 states are operated by the Texas Co. and its subsidiaries. Aggregate crude-oil capacity of the company's refineries is 394,850 bbl. daily. Capacity for producing cracked gasoline is 110,700 bbl. daily.

In furthering its participation in the production of war materials, the company's capacity for manufacturing high-grade lubricants is being increased and a plant is under construction for the purpose of producing toluene. The company is also among five concerns collaborating in the construction of a butadiene plant on the Gulf Coast for the manufacture of synthetic-rubber components.

Last year, through new facilities and improvement and additions to its existing sulfuric acid alkylation plants, the company increased capacity for manufacture of aviation gasoline. Other improvements and additions are now under construction which will extend the company's position in the field of high-octane fuel production. Crude-oil runs to stills in 1941 were the greatest in the history of the company and its subsidiaries.

Research and process development efforts of the company are now directed toward greater production of war materials. The company is a part owner in such processes as sulfuric acid alkylation, catalytic cracking, hydro catalytic reforming, isomerization and numerous other catalytic operations.

A large portion of the aviation and other lubricating oil produced by the industry to fulfill the present war requirements, the company asserts in its annual report, is manufactured by processes developed and licensed by Texas Co. and its subsidiaries.

DOMESTIC REFINERY OPERATING DATA

Refinery locations—	Crude-oil capacity (bbl. daily)	Cracked gasoline (bbl. daily)
Port Arthur, Tex.	135,000	52,000
Port Neches, Tex.	40,000	.....
Houston, Tex.	27,500	1,000
West Dallas, Tex.	15,000	7,000
San Antonio, Tex.	6,000	2,200
El Paso, Tex.	2,000	1,000
Amarillo, Tex.	7,000	2,400
West Tulsa, Okla.	19,000	6,000
Pryse, Ky.	5,000	2,000
Lockport, Ill.	45,000	15,500
Casper, Wyo.	7,000	3,600
Craig, Colo.	3,000	1,500
Cody, Wyo.	3,000	.....
Calpet, Wyo.	350	.....
Sunburst, Mont.	7,000	2,500
Norfolk, Va.	2,000	.....
Claymont, Del.	3,500	.....
Providence, R. I.	3,500	.....
Los Angeles, Calif.	32,000	4,700
Fillmore, Calif.	4,000	1,000
Laurenceville, Ill.*	28,000	8,300
Total	394,850	110,700

*Indian Refining Co.

Refineries of the Texas Co. group are furnished crude by pipe line, producing and purchasing divisions which are large and important factors in these various branches of the industry. Principal pipe-line development last year was construction of 101 miles of line from the Apache pool, Caddo County, Oklahoma, to Brook Station, near Seminole, Okla. Other projects are now under way or proposed that will increase transportation capacity of the company's lines serving the Middle West, contributing to the necessity of expanding deliveries to the East Coast.

Prewar refinery operations of the company included one of the large plants in France which is now under German management. The company is half owner of the Bahrein Production Co., Ltd., which operates a 20,000-bbl. refinery on Bahrein Island, Persian Gulf Coast, and in California Arabian Standard Oil Co., which has a small plant at Ras Tanura, Arabia.

Marketing operations of the company cover all 48 states and the District of Columbia where a complete range of petroleum products is available through company-owned and dealer-contract outlets. Manufacturing operations of the company are under the direction of M. Halpern, New York, who has served the organization continuously since 1916.

●

Synthetic-Rubber Plant in Ohio Starts Operations

AKRON, Ohio.—The first government-financed synthetic-rubber plant for Goodyear Tire & Rubber Co., with approximate capacity of 15,000 tons annually, has started operation near Akron.

A second unit with an additional 15,000-ton capacity is scheduled for completion in November when total output, including the facilities already in operation, will reach 32,000 tons.

The Goodyear plant operates on butadiene and styrene supplied from petroleum refining and chemical companies. Raw materials are polymerized at the Goodyear plant producing a raw synthetic latex which is then converted by the rubber company to finished products.

MORE AND MORE GAS PLANTS

Standardize on *Florite* For Dehydration

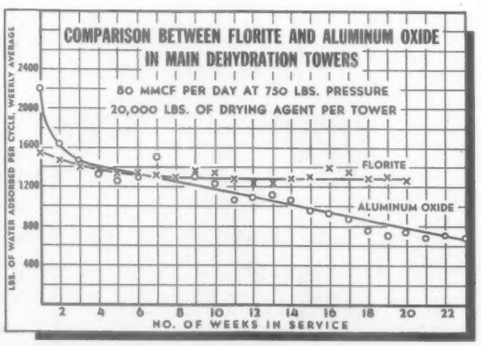
PERFORMANCE COUNTS . . .

Here's a recent ten-ton shipment of FLORITE DESICCANT stacked at a gas plant in Texas and ready to be charged to the dehydration towers, and here's the reason for the growing acceptance of FLORITE: SUPERIOR PERFORMANCE.

ADVANTAGES

FLORITE has two advantages over competitive drying agents. First — its ability to selectively adsorb a relatively constant weight of water, day after day and week after week as indicated in the accompanying chart. Second — its very high drying efficiency where bone dry gases and liquids are required, such as the dehydrating of natural gas, propane, gasoline, air, nitrogen, carbon dioxide, refrigerants, etc.

FLORITE selectively adsorbs 4 to 20% of its weight in water, depending upon the particular application, and is regenerated by heating to 300-350° F. We invite correspondence on your particular drying problems. WRITE FOR DESCRIPTIVE LITERATURE.



The ability of FLORITE DESICCANT to adsorb a constant amount of water is illustrated in above graph, based on technical data furnished by user.

FLORIDIN COMPANY, INC.
178 LIBERTY STREET WARREN, PENNA., U. S. A.

KEEP 'EM FLYING WITH

WAR LUBRICANTS

MODERN PROCESSES by

MINUS 20°F
POUR POINT AND OTHER
HIGH SPECIFICATION
LUBES

INCLUDING:

- SOLVENT REFINING
- SOLVENT DEWAXING
- SOLVENT WAX REFINING
- SOLVENT DEASPHALTING
- CONTACT FILTRATION
- SULPHURIC ACID TREATING
- HIGH VACUUM DISTILLATION

Complete lubricating oil plants
engineered, designed, fabricated and
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Foster Wheeler Corporation, 165 Broadway, New York, N. Y.

FOSTER FW WHEELER

The Solution of Your
DITCHING PROBLEMS—
"CLEVELANDS"
Dig "Anywhere-Anytime"

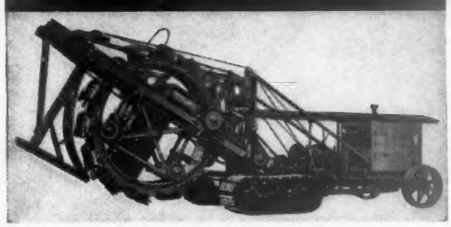
Put "Clevelands" on the line! You'll be the gainer. Whether it's a long mainline job, gathering lines or loops—"hot-spot" reconditioning or merely short scattered routine work such as field lines or ordinary maintenance you'll find "Clevelands" dependability, mobility and all'round utility show definite savings in time and expense.

"Clevelands" accomplish this because practically every operation incidental to mechanical ditching has been speeded up . . . waste motion eliminated . . . precious minutes saved.

Illustrated above is MODEL "140" DITCHER . . . Digs—16" to 30" wide 5' 4" deep, at speeds from ½ foot to 25 feet per minute. Spoil-conveyor shiftable and reversible. Extra strong boom, wheel and buckets. Digs all types of soil successfully. Operates over roughest terrain. Special equipment for stripping pipelines.

THE CLEVELAND TRENCHER CO.
"Pioneer of the Small Trencher"
20100 ST. CLAIR AVE. - - - CLEVELAND, OHIO

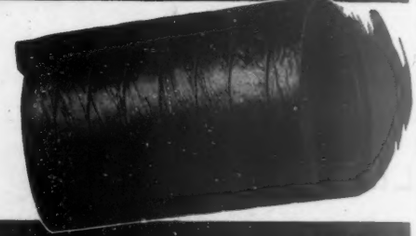
Buckeyes Have the "Guts"



for faster, cleaner, lower cost trenching—day after day—under any conditions.

Buckeye
Check Buckeye First!

For RECIPROCATING PUMPS



An outstanding packing for sealing gasoline and crude oil. Antifrictional twisted metal foil wrapper especially lubricated. High grade asbestos core. Supplied in spiral or die moulded rings.
WRITE FOR BULLETIN AND SPECIFICATION SHEETS
DURAMETALLIC CORPORATION
KALAMAZOO, MICHIGAN

Pipe-Line Activity

Pipe for Phillips Project Is Scheduled to Come From Mills

Arrangements have been made by Phillips Petroleum Co. for obtaining pipe required for completing the large program undertaken this year for pipe-line facilities to supply refining operations and for increasing the outlet northward from Borger, Tex. The project is reported to have an A-1a rating. Mills are scheduled to start rolling 6-in. for the project in the week of June 8 and 8-in. in the week of June 15.

The contractor, O. E. Dempsey Construction Co., has established a field office at Hobbs, N. M., and is working on the right-of-way between Hobbs and Goldsmith, Tex.

Trucks for Pipe-Line Repair Are Excepted From Restrictions

Regulations restricting the operation of motor trucks which become effective June 1 do not apply to trucks used for maintaining pipe lines. An amendment to the original order has been issued recently by the Office of Defense Transportation which exempts trucks used in the repair and servicing of facilities operated by the owners of trucks. Trucks transporting machinery are also exempted. Furthermore, it is reported that there is an assumption that pipe-line operations will be classed with public utilities and that consequently pipe-line trucks will have the same exemptions as trucks operated by public utilities.

A regional conference to formulate plans for oil-field trucks was held in Tulsa last week which was called by J. L. Burke, traffic manager of Stanolind Pipe Line Co., who presided at the sessions as chairman of Shippers Oil Field Traffic Association. An account of what has been done recently to work out plans for dealing with the ODT truck regulations as they apply to oil-field operations generally will be found elsewhere in this issue.

Initial Crude Deliveries Started by Stanpac Line

Initial crude runs through the converted Stanpac gas line were made recently. This natural-gas pipe line, which has been converted into a crude-oil carrier, will handle only light refinable crude oil which will be picked up in the San Joaquin Valley, California. Changes made in pipe-line systems during the past 60 days have increased flexibility so that operators may pick up crude in the coastal district and move it entirely by pipe line either to San Francisco or Los Angeles, Calif. It is possible to move San Joaquin Valley crude to Los Angeles or north to San Francisco by pipe line.

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Pipe Line Is Considered For Northwestern Canada

A survey for a pipe line is now under consideration which will provide an outlet from the Norman oil-producing area in northwestern Canada. The purpose of the line would be to furnish pipe-line transportation to supply the increased activities resulting from military operations.

In the Norman pool there are four producing wells with an estimated potential production of 400 bbl. daily. A small refinery in the field is supplying the local market.

Congress Considers Florida Project

The House is being asked this week to give its approval to construction of a pipe line and barge canal across upper Florida to help alleviate a current fuel shortage along the eastern seaboard.

A bill by Chairman Mansfield of the House rivers and harbors committee has been given legislative right-of-way.

The proposed pipe line would extend from Jacksonville to Port St. Joe, Fla. Regarding the pipe line plans for supplying the North Atlantic region President Roosevelt said he ought to get a report from the committee investigating the problem soon. He referred particularly to the project which would go across Florida.

Three Pennsylvania Lines Reverse Flow

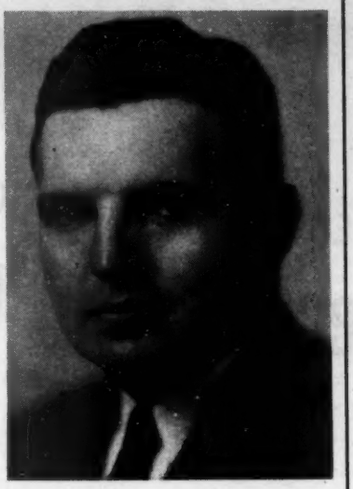
Three oil companies have reversed their westbound pipe lines and now are pumping gasoline and crude oil to rationed eastern areas in quantities according to reports that would soon reach 20,000 bbl. daily for each line.

The Atlantic Refining Co. announced it has started the flow of crude oil from Pittsburgh to Philadelphia, Pa., while the Sun Oil Co.'s line from Cleveland, Ohio, to Philadelphia, Pa., and the Standard Oil Co. of New Jersey's line from Midland, Pa., to Bayonne, N. J., are moving in gasoline.

Crude and Products Lines Are Studied to Solve Problems

In considering how pipe lines may be used most effectively for solving the problems connected with the East Coast shortage, some pipeline executives are directing attention to the large increase in efficiency which can be achieved when a line is used for moving products instead of crude oil. A comparison of capacities for the two types of service shows that a line carrying gasoline moves 60 per cent more than it will when it is moving average Mid-Continent crude shipments. While moving distillates used for fuel a line moves 40 per cent more than it does when moving average Mid-Continent crude oil. This situation suggests that lines shipping eastward from the Middle West can be utilized to the utmost when they are moving refined products instead of crude oil.

Pipe Line Personalities . . . . . J. M. Linehan



J. MARSTON LINEHAN, general superintendent, Mid-Continent Pipe Line Co., comes of a pipe-line family. When he was born at Rising Sun, Ohio, his father, J. J. Linehan, who is now general superintendent of Sinclair Refining Co.'s pipe-line department, was then a gager in a producing area 30 miles south of Toledo, Ohio. The family moved to Bartlesville, Okla., when J. J. Linehan became division superintendent of Prairie Pipe Line Co.

The first pipe-line job held by Marston Linehan was that of water boy for a Prairie main-line gang between Bartlesville and Copan, Okla. In 1917, while still in high school, he served as oil editor for the Bartlesville Examiner. After his college years at St. Benedict's and St. Mary's he worked as a scout for Barnsdall Oil Co. in Osage County, Oklahoma, until he joined the Prairie Pipe Line organization as an inspector late in 1921. During the 12 years he was with this company he served as gager, chief tank strapper and chief gager. In 1932 he became special representative of Consolidated Pipe Line Co., a Sinclair subsidiary, and was located at Oklahoma City, where he handled matters connected with common-carrier shipments. In the period when the Sinclair Pipe Line system was undergoing reorganization, he spent several months with a pipe-line gang engaged in maintenance work on the company's lines in northern Oklahoma. The following year he joined the Mid-Continent Pipe Line organization, then known as Cosden Pipe Line Co., and his first position was that of superintendent of the southern division. In January 1939 he became assistant general superintendent. After the death of J. A. Beyhan on October 14, 1941, he became general superintendent.

He lives in Tulsa with his wife, who is a niece of the late Capt. E. Constantin, an independent refiner, and their two boys, John Joseph, 3, and Earl Lewis, a year old.

OPC Asks WPB Again For Steel for Big Line

Petroleum Coordinator Ickes has asked the War Production Board again for priorities on steel to build the pipe line from Texas to New York as a means of relieving the petroleum emergency in the East.

He has not abandoned hope for the pipe line and he expects to appear personally before WPB in behalf of the project.

WPB Chief Donald Nelson said recently that the country could have this pipe line only if it wanted to sacrifice production of ships and tanks. Priorities for the project have been rejected twice, by the old Supply Priorities Allocation Board and the WPB.

Wisconsin Commission Refuses To Reconsider Gas-Line Permit

MADISON, Wis.—Rehearing was refused by the Wisconsin Public Service Commission May 28 on its April order authorizing the Wisconsin Southern Gas Co. to construct 10 miles of pipe line from Lake Geneva to the Wisconsin-Illinois line where it will connect with facilities of the Natural Gas Pipeline Co. of America.

The Wisconsin Railroad Association and railroad employe representatives asked rehearing on ground that the commission had trespassed upon jurisdiction of the Federal Power Commission.

The company now supplies manufactured gas in Burlington, Lake Geneva, Delavan, Elkhorn, Williams Bay, Fontana, Walworth, and nearby rural and summer resort centers in Wisconsin.

Liberty Pipe Line Proposes To Move Line to Florida

Construction of a pipe line across Florida for increasing the flow of oil products from the Gulf Coast to the Atlantic seaboard is given consideration by Toddie Lee Wynne, president of American Liberty Pipe Line Co., who is submitting his firm's proposal to various war agencies.

Materials for the line according to Mr. Wynne's proposal would be provided through the salvaging of a 200-mile line extending from the East Texas field to Houston, Tex., owned by American Liberty. This system, built between 1931 and 1936, would be taken up and moved to Florida. On the East Texas-Houston line are seven pump stations, which also would be moved, and the company also has about 700,000 bbl. of storage which could be moved to the Florida line.

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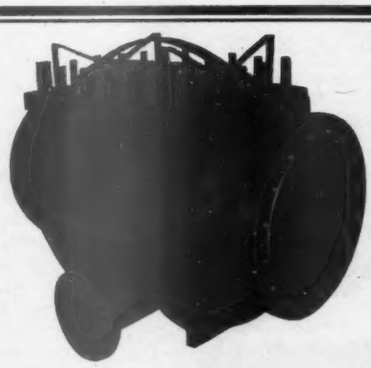

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FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

Completions reported last week totaled 311, representing a decrease of 22 from the previous week. Oil wells dropped by 15, gas wells 2 and dry holes 5.

Out of the normal number of new pools, new sands and extensions reported each week, there are occasional reports of showings which may not be important in themselves but which indicate possibilities in new areas. This week, there are three such developments, a minor extension of the Cambrian sand production in Kansas, a showing in the Ellenburger in Sutton County, Texas, and production from the Trenton limestone in Virginia (see p. 94).

The discovery of Lamotte sand production near the Kruckenberg pool extends the Otis-Albert trend to the southeast toward Stafford County and the Silica district. Except for the Otis-Albert area, Cambrian production has been confined to the northwestern end of the Central Kansas uplift.

South and east of Crockett County in Texas, there have been a few small Permian lime pools in the Edwards Plateau but production has not been sufficiently large to warrant much prospecting in this area of greater-than-average risk. The whole area is underlain by the Edwards lime which lies unconformably on lower beds, not only masking the structure but interfering with geophysical exploration of the lower beds. Ellenburger production has been found on the northern edge of the plateau, notably in Big Lake and discovery, even of good showings, in this formation near the center of the plateau is of great significance.

The Virginia discovery not only opens up a new state to production, but it lies in a trend which is east of any known production in the Appalachian area. To find oil in a formation as low as the Trenton is, to say the least, surprising in a region where metamorphism has been carried so far as it has here. The high gravity of the oil places it in the same class as Cabin Creek crude which comes from the Berea. Further developments in this area will be watched with interest as the first showings are not of great commercial importance.

CANADA: At three widely separated points, considerable activity is under way as a result of the new Alaska Highway. The Fort Norman oil field which has hitherto supplied the needs of the Northwest Territory from four wells, will be developed further. More tests are planned in the Peace River territory and a party representing the Canadian Government, Canada's two transcontinental railway systems and its largest mining company has inspected the Athabaska tar sands (p. 95).

LOUISIANA GULF COAST: Favorable showings were logged in a test in the Castell area, Terrebonne Parish (p. 82).

CALIFORNIA: Saturation has been found in a test on a steep structure east of Piru in Ventura County (p. 78).

MONTANA: The West Kevin gas field has been extended to the west and may eventually join Cut Bank gas area (p. 90).

ILLINOIS: Drilling has spurted following loosening of spacing requirements. An Aux Vases showing is reported from a Jefferson County test. The operator has taken out 17 permits for additional drilling around a tight well in Franklin County. Madison County's Trenton discovery is a 100-bbl. pumper (p. 89).

EAST TEXAS: Abandonment of the first recent Smackover test in Limestone County has not greatly affected the play as a shoreline is being sought and it was considered unlikely that the first test would find it. Finding the lime gives an important clue as to the location of the wedge edge (p. 87).

OKLAHOMA: Prospecting in the old shallow areas continues with good results, both in oil and gas production. Extension of the drilling regulations in force in Illinois to this area are needed in order to make the most of existing market demands and transportation facilities (p. 84).

TEXAS GULF COAST: The new deeper pay found at North La Ward appears to be a blanket sand covering the entire structure as the second well, 1½ miles southeast of the discovery, is a producer. A new and shallower pay has been opened in Ganado, also in Jackson County. A shallow Wilcox gas pool has been opened in Fayette County, while additional showings are reported from a deep Wilcox sand test in Tyler County (p. 83).

SOUTHWEST TEXAS: The Seeligson pool is extended ¾ mile and into Kleberg County. A new deep sand, believed to be basal Frio, has been opened in the Refugio field. Orange Grove is extended 1 mile to the east (p. 86).

KANSAS: The Lamotte has proved productive near the old Kruckenberg field which had unimportant Kansas City-Lansing and Arbuckle production. Lindsborg is extended 1 mile (p. 91).

NORTH DAKOTA: Four large blocks have been taken by a major company in the western part of the state (p. 90).

ARKANSAS: The future of the Midway field looks more promising each week as new wells show further extension of production to the south and east (pp. 74 and 93).

WEST TEXAS: Andrews County continues to be the district's most active area with wildcats and newly discovered pools sharing interest. The wildcat campaign is spreading north into Cochran and Gaines counties (p. 81).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended May 30, 1942)

	Oil	Gas	Dry	Total	Footage	Tl. comp. to date 1942	Tl. comp. to date 1941
N. Y., Pa., and W. Va.	43	13	6	62	118,729	1,552	2,160
Ohio	7	7	3	17	43,626	399	614
Indiana	2	2	4	8	11,904	152	188
Kentucky	1	1	1	3	3,165	154	267
Illinois	18	0	5	23	68,235	676	1,310
Michigan	7	2	5	14	33,404	283	352
Kansas	11	0	10	21	69,729	621	753
Nebraska	0	0	0	0	0	18	37
Missouri, Iowa	0	0	0	0	0	9	9
Oklahoma	10	2	11	23	79,727	563	606
Texas:							
North Central Texas	8	1	12	21	58,632	555	1,103
West Texas	25	2	4	31	112,122	733	820
Texas Panhandle	2	0	0	2	6,125	202	475
East Texas	5	0	7	12	55,053	186	216
Texas Gulf Coast	11	2	5	18	110,962	375	435
Southwest Texas	12	0	11	23	117,993	585	737
Total Texas	63	5	39	107	460,887	2,636	3,786
North Louisiana	5	0	1	6	27,212	218	240
Louisiana Gulf Coast	8	0	4	12	115,447	245	355
Total Louisiana	13	0	5	18	142,659	463	595
Arkansas	2	0	0	2	12,436	64	62
Mississippi and Southeast	0	0	1	1	8,974	40	101
Montana	0	1	0	1	2,608	65	97
Wyoming	0	0	1	1	4,129	40	57
Colorado, Utah	0	0	0	0	0	4	17
New Mexico	1	0	1	2	7,422	132	116
California	4	0	4	8	23,376	338	421
Total United States	182	33	96	311	1,091,010	8,209	11,548
Total previous week	197	35	101	333			
Week ended May 31, 1941	449	44	151	644			

REGIONAL SURVEYS

Beginning on the next page is the third of a series of surveys of activity in the various producing areas of the United States. The first of these surveys covering Illinois was published in the May 14 issue and the second, on East Texas, appeared last week. The fourth survey, dealing with the Los Angeles Basin of California, is scheduled for the June 25 issue.

Wilcox Trend Play May Extend Into South Central Texas

By F. L. SINGLETON

ALTHOUGH the South Central Texas sector of the Balcones fault line has been void of any outstanding discovery for the past several years, development for the first 5 months of the year has been maintained at about the same level as last year. Thus far a total of 55 wells have been completed, a decrease of only 12 wells from the same period of 1941. Of the completed wells, 14 were producers, 39 dry holes and 2 were gas wells.

At the end of April a total of 18 wildcats had been drilled and all were dry. The majority of these were shallow tests ranging in depth from 500-3,500 ft., and were located in Atascosa, Bastrop, Bexar, Edwards, Guadalupe, Lee, Milam, Travis, Val Verde and Wilson counties.

The trend of development in this district has followed the same pattern since 1922 when it was established as an important producing area with the opening of Edwards lime production at Luling. The high per acre recovery which has been obtained from the Edwards lime, plus the possibilities of developing shallower production from the Taylor-Navarro series and the Austin chalk, has provided an incentive for a continuation of exploration and the drilling of such tests continues to attract the usual amount of interest. However, as this exploration fails to open new reserves it is becoming more apparent that the future possibilities of the area hinges on deeper exploration or a new type of trend play which at a recent date seemed to be developing. This does not mean that any large-scale deep exploratory campaign will be undertaken or that the search for shallow production will be discontinued. On the other hand the search for deeper production will be slow, but the possibilities already shown by a few scattered deep tests offers encouragement to this type of development.

Glen Rose Test Started

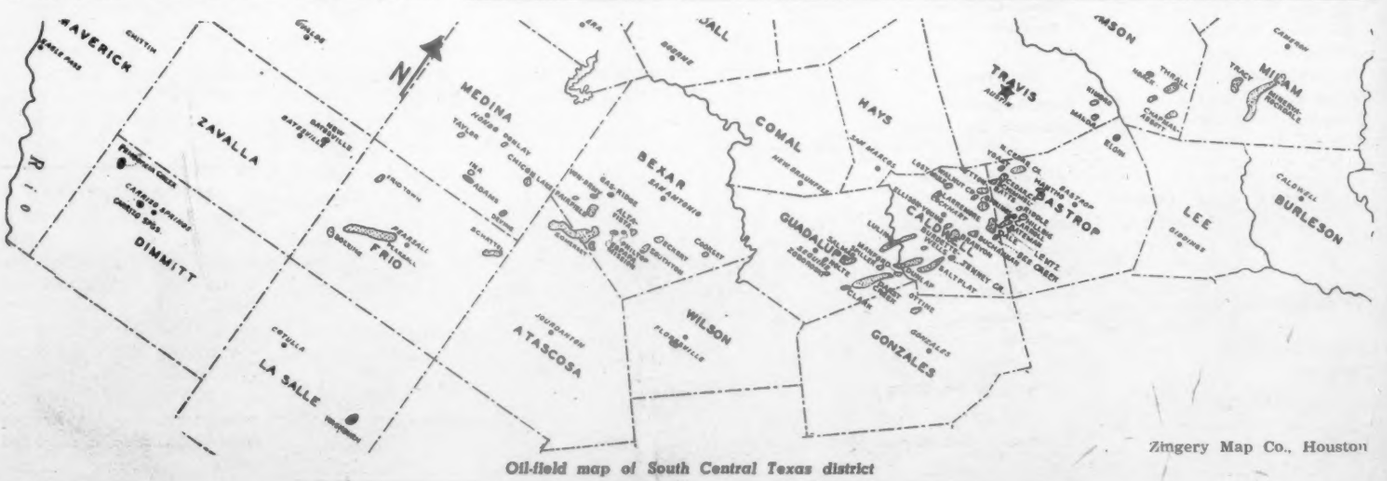
Of particular interest is the projected deep test recently started by Humble Oil & Refining Co., 4 miles northeast of Atherton in Dimmit County, which is expected to test the Glen Rose lime of lower Cretaceous age below 7,000 ft., or if no shows are encountered it may be drilled to the Trinity series. Thus far no commercial production has been developed from these sections although they are generally regarded as offering favorable possibilities, but actual development has been retarded by the expensive cost of drilling and the lack of information on the general area.

Production from the Glen Rose lime was first indicated in 1929 when the old Rycade Oil Co. 1 Chittim, located on the Chittim anticline, Maverick County, flowed wet gas from the Glen Rose at 5,600 ft. The acreage in this area was later

FIELD DATA, SOUTH CENTRAL TEXAS FIELDS

Field, county, name of pay—	Discovery year	No. prod. wells	Daily ave. prod.	Jan. 1, 1942 cumulative prod. (M. bbl.)	Type of structure	Depth	Top of pay	Gravity of oil
Alta Vista, Bexar, Navarro sand	1912	33	6	58	Sand lensing, faulting	250	220	14-16
Bateman, Bastrop, Dale lime	1932	10	24	617	NE-SW fault	2,200	2,150	37
Bee Creek, Caldwell, Dale lime, serpentine	1940	28	250	158	Fault	2,240	2,050	39
Branyon, Caldwell, Austin chalk, Edwards lime	1931	159	657	2,588	NE-SW fault	2,275	1,816	37
Buchanan, Caldwell, serpentine, Austin chalk, Edwards lime	1929	34	74	427	NE-SW fault	2,455	1,700 2,200 2,400	39.5
Burdette Wells, Caldwell, Edwards lime	1936	4	6	40	Fault	2,250	2,230	28
Carrizo, Dimmit, Navarro	1941	1	5	4	Anticline	2,298	2,292	30
Cedar Creek, Bastrop, serpentine	1933	10	34	284	Serpentine plug	1,700	1,695	34.2
Chapman Abott, Williamson, serpentine	1930	71	189	4,535	Domal type	1,915	1,750	36
Chicon Lake, Medina, Navarro	1929	80	70	72	Serpentine plug	750	260	19-33.7
Dale, Caldwell, serpentine, Dale lime	1927	47	130	1,406	Fault	2,300	1,920	37.5
Dale West, Caldwell, serpentine	1937	9	45	99	Serpentine plug	2,200	1,850	37.5
Darst Creek, Guadalupe, Edwards lime	1928	371	5,871	51,603	Fault	2,700	2,600	32.3
Deupree, Bexar, Taylor marl	1934	3	2	(*)	Fault	1,034	1,000	19.2
Dunlap, Guadalupe and Caldwell, Austin chalk	1930	11	30	125	Fault	2,375	2,300	38
Day, Guadalupe, Austin chalk	1940	0	0	1	Fault	2,685	2,375	36
Eckert, Bexar, Navarro	1921	118	82	950	Sand lensing against fault	790	620	35.4
Elgin, Bastrop, Austin chalk	1941	1	2	2	Fault	3,000	2,650	36.8
Ellison Young, Caldwell, Edwards	1937	....	....	136	Fault	2,300	2,250	38
Fairfield, Bexar, Anacacho lime	1938	2	4	4	Fault	1,196	1,140	27.8
Gas Ridge, Bexar, Navarro	1912	61	66	22	Anticline	1,300	300	22
Hilbig, Bastrop, serpentine	1932	12	140	1,610	Domal type	2,500	2,450	37
Jones, Bexar, Navarro	1921	3	2	1	Terrace		700	
Kimbro, Travis, serpentine	1935	6	5	17	Serpentine plug	740	630	36.5
Larremore, Caldwell, Edwards lime	1928	12	61	324	Fault	1,300	1,000	23.5
La Vernia, Guadalupe, Navarro	1938	31	64	25	Terrace	728	704	41.9
Lentz, Bastrop, Dale lime	1941	3	39	5	Fault	2,244	2,226	...
Luling, Caldwell and Guadalupe, Austin chalk, Edwards lime	1921	589	5,545	76,991	Fault	2,200	1,900	34-38
Lytton Springs, Caldwell, serpentine	1925	152	291	7,959	Serpentine plug	1,660	1,250	37.5
Matthews-Noack, Williamson, serpentine	1933	38	69	562	Domal type	900	855	37
Minerva Rockdale, Milam, Navarro, Taylor	1921	403	291	3,651	Sand lensing, faulting	650	1,650	37.6
Pearsall, Frio, Navarro, Austin chalk, Edwards lime	1934	35	311	1,497	Fault	3,900	5,800	26-38
Philtop, Bexar, Austin chalk	1938	3	3	(*)	Fault	1,114	1,100	23
Riddle, Bastrop, Austin chalk, serpentine	1938	5	25	75	Fault	1,650	1,750	39
Salt Flat, Caldwell, Edwards lime	1928	291	3,356	42,689	Fault	2,740	2,600	36-38
Somerset, Bexar, Navarro-Taylor	1912	916	564	11,503	Fault	1,200	2,125	32-44
Southton, Bexar, Navarro	1922	102	54	651	Fault	800	600	34
Spiller, Guadalupe, Buda lime	1938	3	7	5	Fault	2,298	2,010	38.3
Taylor, Ina, Medina, Navarro-Taylor	1922	5	10	159	Anticline	940	290	16-19
Tenney Creek, Caldwell, Austin chalk, Buda lime	1940	22	296	92	Fault	2,370	2,703	35.5
Thrall, Williamson, serpentine	1915	21	61	2,474	Domal type	1,000	700	36.5
Von Ormy, Bexar, Navarro	1931	108	95	249	Fault	725	506	36-39
Walnut Creek, Caldwell, serpentine	1938	1	0	3	Serpentine plug	1,338	1,225	36.1
Yoast, Bastrop, serpentine	1928	4	20	935	Serpentine plug	1,598	1,350	15.2
Zoboroski, Guadalupe, Austin chalk	1931	14	61	222	Fault	2,200	2,050	34

*Included with Alta Vista.



Oil-field map of South Central Texas district

Zingery Map Co., Houston

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acquired by the Wellington Oil Co., which recently completed 2 Chittim as a small producer in the Georgetown lime at 2,966-3,030 ft. Additional deep drilling on this structure can be expected in the future.

Wilcox Play to Southeast

A large portion of the Balcones fault line district has been affected by the discovery of Wilcox sand production in the Washburn area, La Salle County, the latter part of 1940. The search for this type of production through the Balcones fault line has been heretofore overlooked as it was generally believed that the Wilcox this far updip would carry water. Since this production was found in the Washburn field at depths from 4,800 to 5,500 ft., it became apparent that a large portion of counties grouped in the area offered favorable possibilities and would eventually receive considerable development. Such a play is now getting under way, and within recent weeks Wilcox sand production appeared to have been opened in Wilson County by Holland Oil Co. 1 Boysen, located near the town of Poth. This well was drilled to a total depth of 4,407 ft., and casing was cemented for testing following a drill-stem test that recovered 360 ft. of 26.8-gravity oil. The top of the Wilcox sand was tentatively established at 2,696 ft., and several sands were logged throughout the section. Considerable geophysical work has been done by independent and major companies and an increase in this type of exploration is anticipated. Other counties in which this type of exploration can be expected include: Atascosa, Gonzales, Guadalupe, Bastrop, Lee and Milam.

Edwards Plateau

There is a vast amount of unexplored acreage in South Central Texas and perhaps the largest area in which drilling has been limited to a few tests is the Edwards Plateau, extending through Kendall, Bandera, Real, Kerr and Edwards counties, comprising some 9,000 acres. Several wildcats drilled in this area logged encouraging showings in the Pennsylvanian and Ordovician formations, but no sustained exploration campaign has ever been undertaken due to the high cost of drilling and lack of information on the area. The area is still regarded as a potential undeveloped oil reserve and exploration in the area can be expected to be revived.

What may prove to be the forerunner of a new Austin chalk or Edwards lime pool was the recent showing of Weigand Brothers 1 J. T. Gillam, southwest of the town of Pearsall, Frio County. This well topped the Austin chalk at 5,200 ft., and drilled the formation to a total depth of 5,375 ft., and 5½-in. casing was cemented at 4,836 ft. to test a crevice in the Taylor marl at 4,871-90 ft. The well showed for a small pumper but was recently abandoned although it may be reworked after the war or another test will be drilled.

At a recent date there were 14 wildcats drilling in the district. These wells are located in Bastrop, Bexar, Kimble, Lee, Dimmit and Williamson counties.

A recent survey of the district showed a total of 47 producing fields in which 3,833 wells were producing at the daily rate of 18,976 bbl. Most of these wells are marginal producers and production of many is being sustained by reworking. Many of the fields are completely developed and only a limited number of locations remain to be drilled.

Importance of Midway Field Increases Steadily

AFTER getting away to a somewhat disappointing start, the Midway field in Lafayette County, Arkansas, is confirming early claims as to its importance. The discovery well, Barnsdall 1 Edgar Bond, NW SW 11-14-24, is on the highest point on the structure found to date, but wells to the southeast of the discovery are finding the pay at practically the same level.

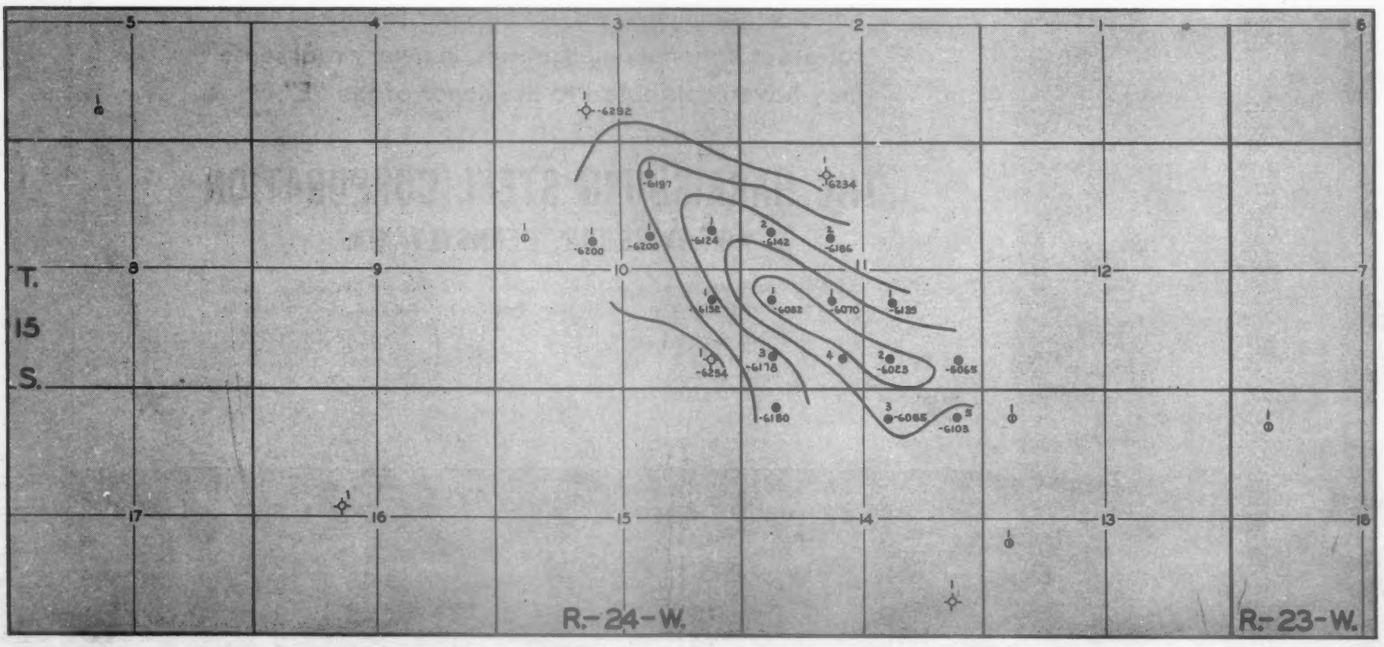
With the exception of the east offset, all of the wells completed during the early development period were more than 90 ft. lower than the discovery and the fact that the northwest diagonal offset was the highest of the group indicated that the trend of the structure was northwest-southeast. All signs, however, pointed to a relatively short axis in this direction until Barnsdall 2 Roberts found the top of the pay at —6,043 ft., or only 11 ft. below the discovery.

The first indication that the structure was not long and narrow came when Barnsdall 1 Clyde Beck, NW NW Section 14, found the top of the Smackover lime porosity only 2 ft. below the level of its north offset. This flattening on the west side at rather low levels was confirmed by Barnsdall 1 Barney Powell, SE NW Section 10, and the west offset, 2 Powell, has been staked. It is entirely possible that this flattening actually indicates a reversal in the dip and that 2 Powell may be higher than 1 Powell. If this is so, it will prove the existence of another structure. Barnsdall has also stepped out more than 2 miles from production in 1 Spencer-Gunter, SE SW Section 5, and at last reports was below 3,720 ft. with 3,000 ft. to go.

The abandonment of Goff 1 McClaine, SE SE Section 14, at 6,500 ft. without finding the Buckner indicates that the top of the Smackover porosity would fall below —6,450 ft., or 233 ft. below the water level. This well, being south of the extension of the high was not of major interest except that the sudden drop might indicate the presence of a fault which would limit the structure to the south.

Last week, three wells reported lime tops showing that the crest of structure turning from northwest southeast to west east. Barnsdall 4 Roberts, SE SE Section 11, found the top of porosity at —6,065 ft. which was unexpectedly high, while 6 Roberts ran low in the NE NE Section 14. After the accompanying map was prepared, Barnsdall 1 McClaine reported the top of porosity at —6,058 ft. making it the third highest well in the field. In the NW NW 18-14-23 Southwood 1 Hodnett is shut down waiting a check on the structure in these three wells. It is probable that the favorable results obtained will encourage the continuance of work on this well.

With the water level at —6,217 ft., there are 11 locations offsetting production which will probably find the pay well above this level. Developments in the NW Section 10 may indicate that the dry holes in Sections 3 and 10 are embayments in the structure and that the production found to the east will be duplicated on the west.



Midway oil field, Lafayette County, Arkansas. Contours on top Smackover porosity

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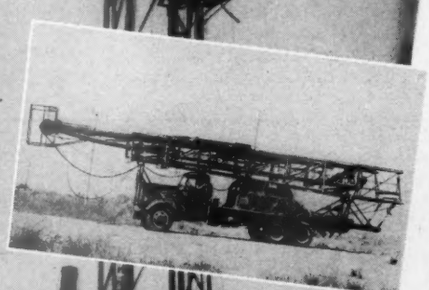

Left: Franks 90' telescoping servicing derrick. Only 4 to 7 minutes is required to raise or lower the derrick. When the derrick is telescoped and folded over the truck (as shown in inset), the unit comes within road limits for location-to-location moves.

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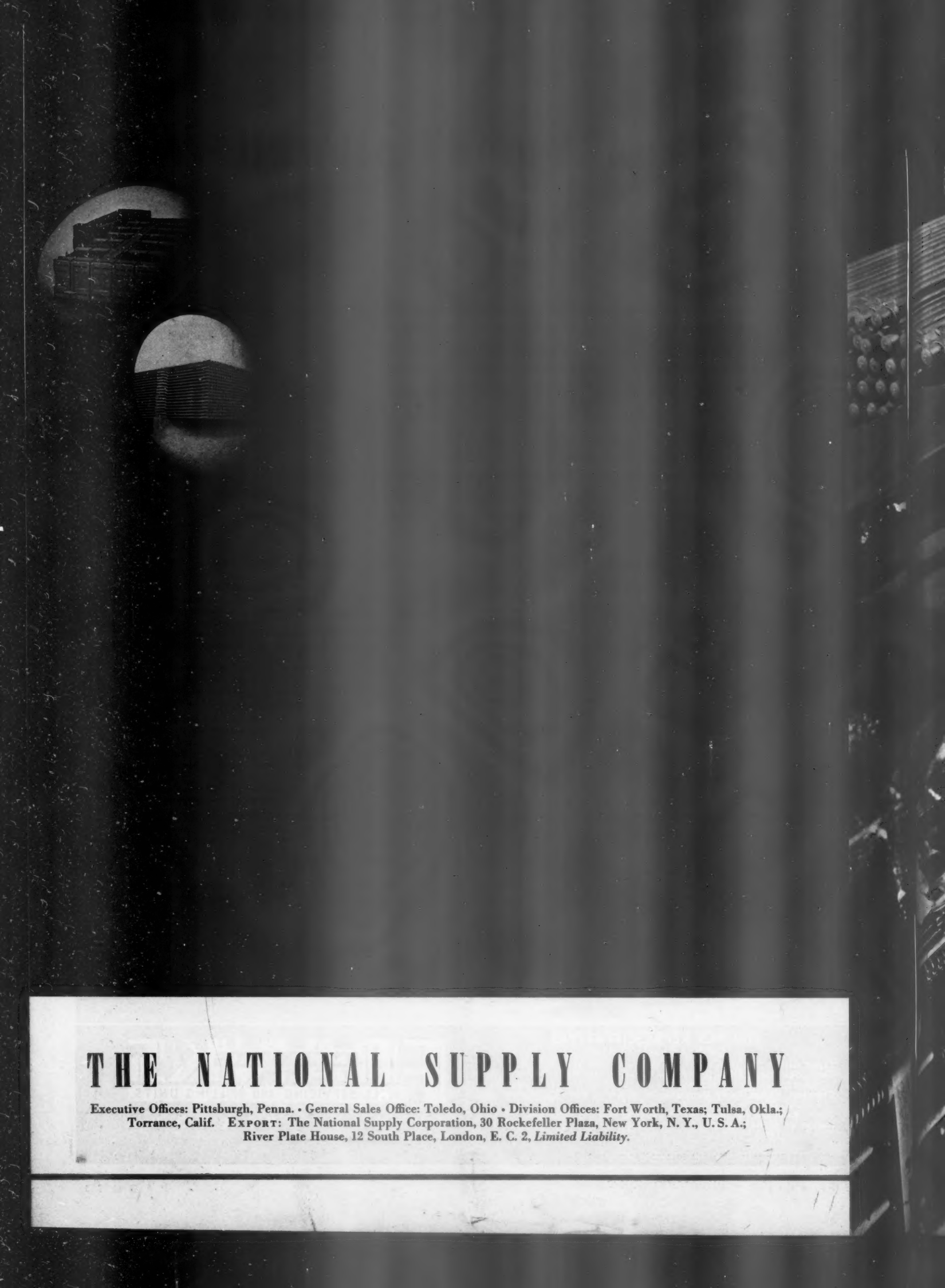

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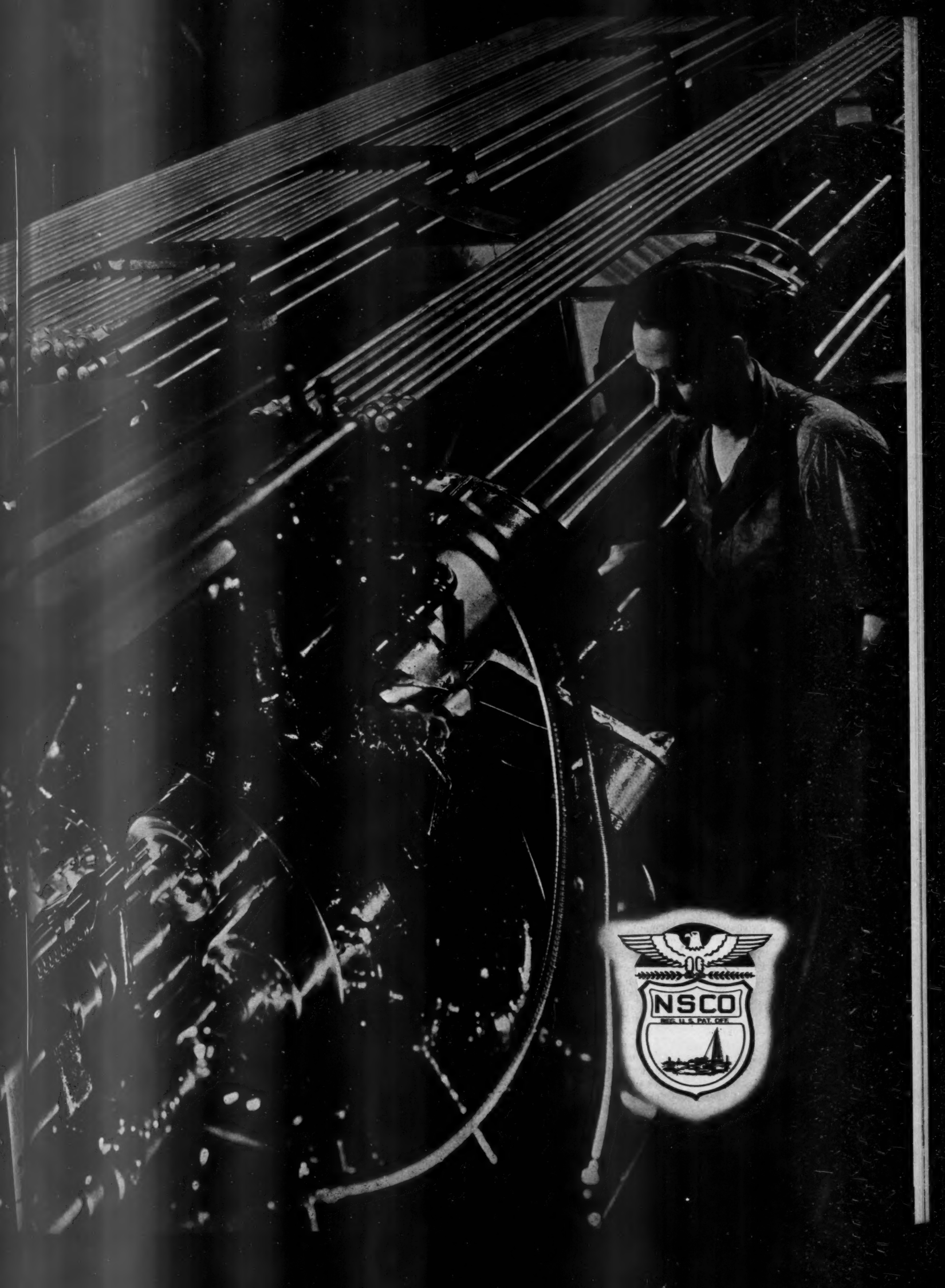
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CALIFORNIA FIELD REPORT

Wildcat on Ramona Anticline, Ventura County, Shows Oil

By L. P. STOCKMAN

LOS ANGELES, Calif.—Continental Oil Co. appears to have the making of a commercial well on the Ramona anticline east of Piru in Ventura County if the results of drilling to date are any criterion of what may be expected. While it is a long way from showings on the ditch to oil running into tanks, wildcats sometimes show up overnight. Continental's wildcat on the Ramona anticline is 1 Holser in 14-4n-18w and at 4,269 ft. the well has approximately 100 ft. of oil sand. Core recoveries have not been as good as might be desired and for this reason porosities and permeabilities as well as saturation of the sand remain to be definitely determined. The Ramona structure is a jackknife anticline with steep dips and the productive area would therefore be expected to be relatively small. Formations are so soft that the company was forced to set a whipstock to prevent the bit from deviating from the vertical and drifting down the flank of the structure. The bit was still in the pay at the close of the current week and efforts being made to orient the hole have not yet proved effective. Some additional drilling may be done before making a formation test but no definite decision has been reached as to the next move. The Holser wildcat has not shown any great amount of gas and at the present depth the well may either make a small flowing well or a medium pumper. For this reason it is quite possible the company may resume drilling or core ahead to open up some additional formation. The oil sand is believed to be the Sespe and since the Sespe has always been noted for long-lived production and quite prolific, Continental may open up a better field than appears on the surface to date.

Coastal Development Increasing

The coastal district is receiving more attention from prospectors than at any time previously because prospectors are getting away from the beaten trails in an effort to develop additional reserves. The San Joaquin Valley is the largest basin in the state but from now on it will take a lot of careful searching before new fields are found as most of the so-called production trends have been tested. In order to broaden the scope of work, prospectors have reentered the coastal district which presents some excellent prospects for new discoveries. In addition to Continental Richfield Oil Corp. is doing some deep drilling in the coastal district although its 44 Ojai in 13-4n-22w, in the Ojai district of Ventura County, does not look any too hot at 8,755 ft. This deep test has shown some oil sand but it appears too tight to produce commercially. The company is still working on the hole and may be able to develop production although it is expected to be relatively small. The Ventura Avenue field is the most prolific field in the coastal district and it is still going strong over 26 years after the original discovery. The ability of this great field to keep going can be attributed to progressively deeper drilling but despite this deeper drilling no single operator in the Ventura Avenue field has succeeded in drilling entirely through the Pliocene. For this reason it may be several years before the bottom of the Pliocene is reached, if it ever is drilled through. Ventura Avenue has produced 242,910,229 bbl. of crude oil between discovery and May 1, 1942 and there is every reason to believe that the field may produce that much more before being abandoned. The terrain is rather rough with a surface saddle between the two extremes of the field, through which passes Ventura Avenue, a broad thoroughfare. Shell Oil Co., Inc., and Tide Water Associated are the two principal operators in the Ventura Avenue field and Ralph Lloyd is the largest single landowner.

Rice Ranch Test Under Way

Standard Oil Co. entered the coastal district a few months ago in an aggressive way by acquiring considerable acreage from Rice Ranch Co. and others and already has its initial well making hole on the Rice Ranch property. This well is not yet deep enough to encounter the pay and for this reason it remains to be seen whether Standard will be successful in developing large production in this area. Present plans contemplate the drilling of two tests on this large lease and so the first well might not prove the entire lease barren or productive. Standard Oil Co. has developed good production on the Los Flores property in West Cat Canyon and additional drilling will be done in that area as time goes on. Standard acquired this lease several years ago but held up drilling operations as long as possible. Production was developed in the Miocene and for this reason the entire region shows promise. Union Oil Co. profited most by the development of Miocene production as it has extensive leases and fee-owned acreage at Cat Canyon and in the Santa Maria area. Heretofore Union had been content to sit tight and produce only the Pliocene. There is every reason to believe that all of Union's holdings in the Cat Canyon field will be productive to a large extent in the Miocene. Republic Petroleum is not having much success in its attempt to develop production on the Price lease in the Gato Ridge field of Santa Barbara County due to water trouble. Tide Water Associated is making preparations to start an outpost on the Davis lease in 33-8n-31w, and should be ready to spud soon.

More Discoveries Needed

California prospectors are not experiencing much success in their search for new fields and, unless the rate of discoveries is stepped up later in the year, the industry will wind up 1942 with another draft on crude-oil reserves. Only two new fields have been discovered in California during the current year to date and at present neither looks like a major discovery. Subsequent developments may change the present outlook but right now they appear to be of secondary importance. The new fields found in 1942 are Buena Park in Orange County and Antelope Plains in Kern County. Only one well has been finished in each and consequently not much is known about structural conditions except that indicated by geophysical surveys. Only one major find can be chalked up during the past 2 years and that is the development of Stevens zone production in the Elk Hills field of Kern County but this might not be of much value to the oil industry as the Navy Department hopes to secure possession of the entire Elk Hills field as a future guarantee that the fleet will have fuel oil to meet future needs when oil may not be as plentiful as at present. Standard Oil Co. has been developing Elk Hills for the past year or two in order to determine property values and at the same time undertake development that will be of value to the Navy Department when it comes into possession of the field. In addition to finding deep Miocene production at Elk Hills, Standard Oil Co. has extended the productive limits of the field and will probably extend the limits still further.

With the exception of the Miocene discovery at Elk Hills, not a single major discovery has been made during the past 2 years and there is no evidence that any exception to the rule will prevail in 1942 to date. Discoveries in 1941 included Helm, Jacalitos, Shafter, Turnbull Canyon, Dyer Creek, Raisin City, Union Avenue, Oak Canyon, Panoche, Riverdale, and the Vernalis gas field. None of these fields appear to be of major importance from a production standpoint at present. California prospectors must find at least 200,000,000 bbl. of new production annually in order to keep step with current demand and anything less than this amount means that reserves are being depleted. Prospectors failed to find sufficient new production last year and during the first 5 months of 1942 have likewise failed to discover enough new production to balance demand. Some fields that now look rather unfavorable from a production standpoint may show a substantial change for the better with additional development but there is nothing along this line at present to indicate such a development.

LOS ANGELES BASIN

Continental Oil Co. is still looking for the pay in its third well in the Turnbull Canyon field of Los Angeles County. The unfavorable condition of this outpost further reduces the productive acreage of the Turnbull Canyon field and instead of a plunging nose it now looks like Continental may have found an accumulation against a fault. Developments to date tend to confirm this inasmuch as the company's second well drilled into a fault and on passing south of the fault failed to find production. When this hole was whipstocked to the north it showed excellent flowing production as compared with the company's discovery well which was somewhat removed from the fault and only showed about 225 bbl. daily. Continental's third well, 3 Turnbull Community, which has so far failed to reach the pay, is located north of 2 Turnbull Community and northwest of the discovery well. It is the farthest well of the three from the Turnbull Canyon fault and has shown less than its two predecessors. It has shown a few 6-in. streaks of oil and a 25-ft. interval but not enough to test. The showings of Continental's 3 Turnbull Community tends to show that the Turnbull Canyon field will be of minor consequence from a production standpoint although commercially productive. The fault along the south end of the field reduced the potentially productive acreage about 50 per cent when the second well failed to find production south of the fault and the showing of 3 Turnbull Community in the north definitely limits production in that direction unless the well finds enough additional oil sand in the present zone or another new deeper zone. Nothing is known with regards to the possibility of developing deeper production from actual drilling as both of Continental's first two wells were stopped in the present productive zone. The present well is running over 1,000 ft. deeper than the first or second well in the field and the outlook is not promising.

The Texas Co. is making good progress with its two new wells being drilled in the Buena Park district of Orange County where the company discovered a new oil field a few months ago but it may be another 30 or 60 days before either is completed. This area requires deep drilling and formations are relatively hard. One well is located east of the discovery and the other is be-

OIL and GAS JOURNAL EDITION

BAASH ROSS News

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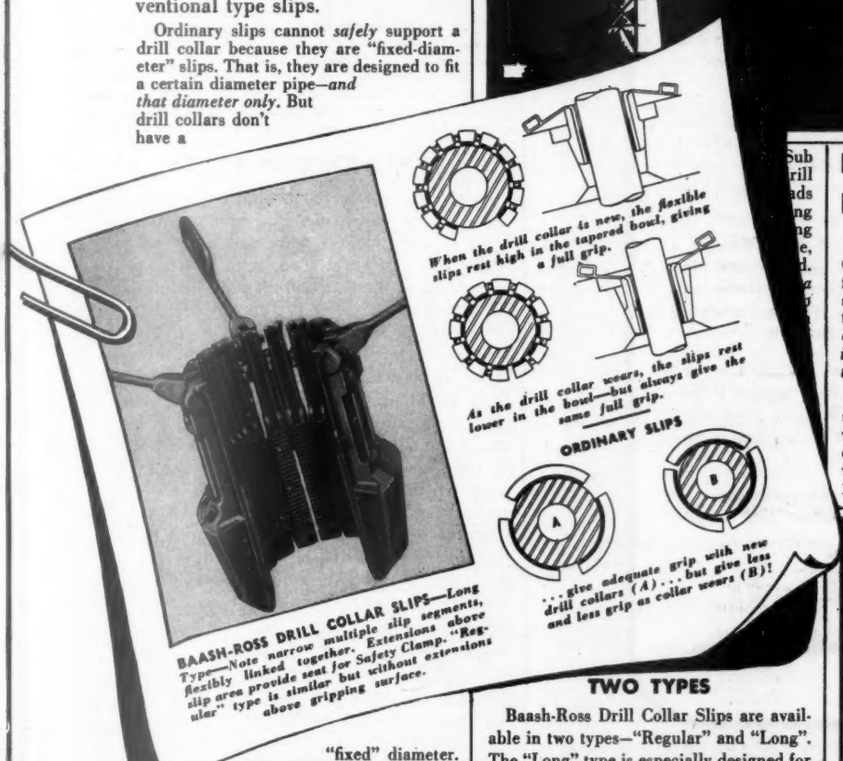
When the drill collar is new, the flexible slips rest high in the tapered bowl, giving a full grip.
As the drill collar wears, the slips rest lower in the bowl—but always give the same full grip.
ORDINARY SLIPS
A
B
. . . give adequate grip with new drill collars (A) . . . but give less and less grip as collar wears (B)!
BAASH-ROSS DRILL COLLAR SLIPS—Long Type—Note narrow multiple slip segments, flexibly linked together. Extensions above slip area provide seat for Safety Clamp. "Regular" type is similar but without extensions above gripping surface.

Rotating as they do against the abrasive, fresh-cut walls of the hole, they lose diameter rapidly—become not only smaller but often out-of-round, as well. Ordinary "fixed-diameter" slips cannot compensate for this wear (see sketch) —consequently, they grip the collar less and less securely, with a steadily increasing risk of dropping it down the hole.

Now look at the Baash-Ross Drill Collar Slip. It's made up of narrow segments, *flexibly hinged together*. It w-r-a-p-s around the collar like a chain tong—fits *every inch* of the circumference whether the collar is new, worn, round, or out-of-round. It's a grip that won't slip on even the hardest-to-hold collars!

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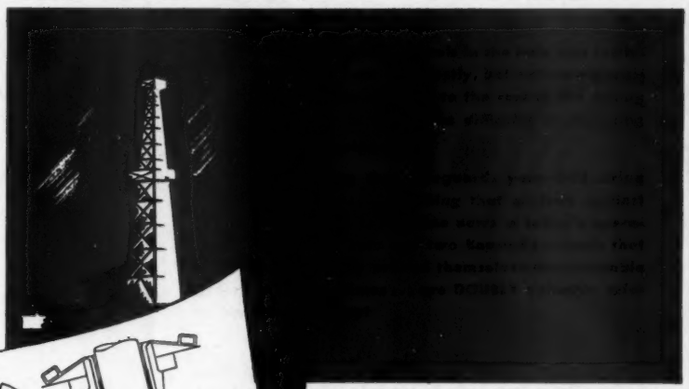
Baash-Ross Drill Collar Slips are available in two types—"Regular" and "Long". The "Long" type is especially designed for use with the Safety Clamp for DOUBLE protection . . . has extensions above the slip surface to provide a seat for the Clamp. Both types have interchangeable liners for long life, low maintenance.

Your investment in a set of these Slips will protect you for years—*there's practically no wear-out to them.* And they're available in sizes to fit all diameters from 3¾" to 8¼". Your nearest Baash-Ross representative has complete details. Why not call him today? Or write for Bulletin 13!



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HERE'S ALL YOU DO: The Clamp is unusually simple and quick to use. Simply wrap it around the pipe above the slips or elevator, drop a pin in place and tighten with a quick cinch of the socket wrench. *That's all there is to it.* Each individual link in the Clamp has an independent gripper wedge that takes a firm initial hold on the pipe surface. As the load increases—or should sudden impact loading occur—the tapered slips wedge themselves even tighter, forming a grip that holds the heaviest loads without slipping. And because the grip is uniformly distributed *at all points*, it will not crush even thin-walled pipe!

Another point—links can be quickly added or removed *on the rig* so that the Clamp can be quickly adapted to fit *any* diameter from 3¾" up. A neat steel case is provided for storing the extra links, as well as the Clamp and wrench, when they're not in use.

MANY USES

Judging by reports, the Safety Clamp is one of the most versatile tools ever put into the fields. Besides safeguarding against dropping flush joint equipment in normal rig operations, operators report finding it ideal as an elevator shoulder when handling prepacked gravel liners. Another reports using it as an emergency shoulder on fishing jobs, lifting as much as 4000' of 4½" drill pipe with it—*safely!*

You need this tool around your rig —for safety, for efficiency, for protecting your hard-to-get drill strings. It's low in cost, and it will last for years with practically no maintenance. Your nearest Baash-Ross representative will be glad to show it to you . . . or write direct for Bulletin 6 giving complete information!

Multiple Grip!

Each separate link in the Safety Clamp carries an independent slip-type gripping member. Wedging action tightens grip as load increases.

Quick Protection!

Simply wrap the Clamp around the pipe, drop a pin in place and cinch the nut tight with a quick-acting wrench. On or off in an instant . . . yet once applied, will not slip under heaviest loads!

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Right now we have bombs in mind. But the valve is still effective in wells located in water where high wind or a stray barge might damage surface connections or in congested areas and towns where property and human lives are at stake.

The Otis Tubing Safety Valve is available in two types—the Type C is actuated by *Pressure Differential* and is adaptable to all flowing conditions. The Type B is actuated by *Flow Velocity* and is best adapted to wells with steady flow.

Check with your nearest Otis Representative or write direct for complete information and details.

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ing drilled west of the first well. These two new wells should therefore prove or disprove the company's geological and engineering departments which hold that one is an outpost and the other a proven location. At La Mirada, 2-A McNally which Texas Co. is drilling in 15-1s-11w, has reached the critical depth and should begin showing something very soon. This wildcat is located due west of the West Coyote field and northwest of the Buena Park field. Some small showings have been noticed on the ditch during the past few hundred feet but the well is showing 80° dips, a rather unfavorable condition. In the West Coyote field of Orange County, Standard Oil Co. is drilling ahead in 129 Murphy Coyote below 8,500 ft. but this well, a deep test, is not reported to have found anything to date. This deep well is the deepest drilled in the West Coyote field to date and is being drilled to determine the possibility of developing deep Miocene production This area requires deep drilling and so the well has not yet reached the critical depth. In the meantime, Standard has located two additional wells to be drilled on this property and early spuds are expected. Both will be drilled to the lowest productive zone but will be carried deeper if 129 Murphy Coyote finds the Miocene productive.

LOS ANGELES BASIN COMPLETIONS

Potrero, Los Angeles County: Tide Water Associated Oil Co. 1 Cypress, 34-2s-14w, recompleted flowing 2,111,000 cu. ft. gas, T.D. 5,580 ft., gun-perf. 7-in. casing at 5,058-68 ft., 5,070-72 ft., test at 5,065 ft. flowed 165 bbl., 46.5-gravity, 22 per cent salt water, squeezed perf. and recompleted as above noted.

Wilmington, Los Angeles County: Pacific Western Oil Co. 3 Patten, 32-4s-13w, recompleted pumping 71 bbl., 14.1-gravity, 50 per cent cut, T.D. 2,930 ft., gun-perf. 2,593-2,923 ft., pulled 8⅝-in. water string in original hole, set whipstock 2,630 ft. and redrilled producing from Ranger zone of Pliocene age,

Royalty Service Corp. 1-A Nelson, 4-5s-13w, recompleted pumping 180 bbl., 14.5-gravity, 7 per cent cut, T.D. 3,530 ft., gun-perf. 2,520-2,880 ft., 3,120-3,528 ft., pulled 7-in. water string in original hole, set whipstock and redrilled to recompletion depth.

SAN JOAQUIN VALLEY

R. S. Lytle has cored a sand body in 66-28-F at Quijarral in 28-20s-16e, but several attempts to make a formation test have failed and will necessitate further work. The sand is the probable equivalent of the Gatchell oil sand in the Coalinga Nose area but it is not yet known whether it contains enough oil and gas to produce. The result of this work will be watched with interest because a successful completion in the Quijarral Hills would probably represent an important discovery especially if the sand body contains oil and is the equivalent of the Gatchell. The Gatchell oil sand is especially prolific in the Coalinga Nose field where it has excellent porosities and permeabilities and excellent saturation. Nothing further could be desired in a productive sand especially in the southern part of the nose where penetrations into saturated oil sands approximate 1,000 ft. Coalinga Nose operators will probably never know how much the field could produce because there is great likelihood that there will be need for curtailment during the next several years. Under curtailment the field is only producing a limited amount of crude oil daily and this has been the case since discovery of the field. It is not at all improbable that the Coalinga Nose field of Fresno County could exceed 250,000 bbl. per day while maintaining a back pressure as a number of these wells were conservatively rated at 15,000 bbl. per day initials. None of the wells completed in the Coalinga Nose field to date have been allowed to produce to the maximum extent. The northern end of the Coalinga Nose field is characterized by a high gas-oil ratio in contrast with the southern end which has a very low gas-oil ratio and a larger flow of oil. The gas cap in the northern section has not shown much tend-

(Continued on Page 84)

Ellenburger Test in Sutton County Showing Oil

By ROBERT INGRAM

MIDLAND, Tex.—Production from the Ellenburger lime was showing in Sutton County last week, some 50 miles southwest of the Crockett County fields and in the heart of the Edwards Plateau region. The well was S. B. Roberts and M. C. Moore 1 George S. Allison, NW NE Section 44, Block K, G.H.&S.A. Survey, 1,260 ft. northwest of Southern Crude 1 Allison, a 13-year-old abandoned gas well. It is also 20 miles northeast of Sonora and about 10 miles southeast of the Page Strawn lime field in Schleicher County.

It had a show of oil and gas from 5,341-69 ft., total depth. Top of the Ellenburger was picked by sample analysis at 5,295 ft. Elevation is 2,364 ft. The show came through 4,000 ft. of upper water, and operators set 5½-in. casing at 5,345 ft. in an attempt to kill the intrusion 7 ft. below the top of the pay zone. Plugs were to be drilled this week for a test.

Another Well at Abell

Seimoneit Drilling Co. 1 Jennie E. Barnhart, Lot 14, Section 15, Block 2, H.&T.C. Survey, one location south of production in the Abell Permian field of Pecos County, flowed at the rate of 405 bbl. a day, natural, through 2-in. tubing, on potential test from pay at 2,271 ft.

In the Abell Ordovician field, Abell 1-B Eaton. 990 ft. from the northeast and southeast lines of the lease in Section 5, Block 3, H.&T.C. Survey, had a show of oil in the Waddell sand on a 1-hour drill-stem test from 5,820-73 ft. Recovery was 120 ft. of mud-cut oil and 20 ft. of drilling fluid. Gas rated only 30,000 cu. ft. daily.

Big Lake Marks Birthday

In the Big Lake oil field of Reagan County, where a fourth pay zone was opened in February and the field's nineteenth birthday was passed last week, Big Lake Oil Co. 20-C University, Section 24, Block 9, University Survey, on the north side of the pool, was drilling below 5,147 ft. The well had started seeking production at the 4,200-ft. level opened ¼-mile southeast by the 19-C University, but failed at that zone and was drilling below 5,147 ft. seeking Ordovician pay. It was an old 2,975-ft. producer being deepened.

On the field's birthday it was announced that a total of 96,915,001 bbl. of oil had been produced, and that the discovery well, Big Lake 1 Santa Rita (drilled by Texon Oil & Land Co.) was still pumping its 6 bbl. a day. Although production was already coming from the Westbrook pool in Mitchell County at the time of the strike, it was the Santa Rita well, with a potenial of 3,424 bbl. natural that set off the Permian basin play.

SOUTHERN WEST TEXAS COMPLETIONS

Wildcats

Crane County: Texas 1-K University, 1,980 ft. from S and E lines Sec. 20, Blk. 30, University Sur., elev. 2,620 ft., dry, anhydrite 1,120 ft., solid lime 3,030 ft., sulfur water at 3,434 ft., T.D. 3,600 ft., 1 mi. S of Dune pool.

Sutton County: Centennial Oil 1 Wyatt, 330 ft. from N and E lines Sec. 4, Blk. 6, T.W.&N.G. Sur., NE part of county, 5 mi. N of Camp Allison, dry, T.D. 430 ft.

Ward County: Jones & Lacy 1 S. R. Carr, 50 ft. NE of river, 330 ft. from NW line of SE. T. P. Hardeman Sur., 2½ mi. NW of Netterville pool, dry, T.D. 500 ft.

Fields

Estes, Ward County: Gulf 170 Hutchings, 1,650 ft. from W and S lines Sec. 10, Blk. O, G.M.M.B.&A. Sur., elev. 2,617 ft., flowed 1,810 bbl. through casing after shot, pay 2,454 ft., T.D. 2,692 ft., *north edge well.*

Fromme, Pecos County: Cordova Union Oil 3 fee, 1,088 ft. from SE line and 330 ft. from NE line of SW cor. 239-acre lease in Pink Phelps Vacancy Sur., pumped 90 bbl. after shot, pay 1,493 ft., T.D. 1,502 ft., *south edge well.*

Keystone Colby, Winkler County: Richardson & Bass 5 Bashara, 330 ft. from N line and 1,320 ft. from E line Sec. 21, Blk. 77, P.S.L. Sur., elev. 2,980 ft., flowed 595 bbl. through ¾-in. tubing choke after shot, pay 3,292 ft., T.D. 3,464 ft.

Noelke, Crockett County: Soma Oil & Gas and Schooler 3-C Noelke, elev. 2,564 ft., gaged 50,000,000 cu. ft. gas, pay 1,233 ft., T.D. 1,296 ft.

M. & M. Production 1-B Bouscaren, elev. 2,812 ft., gaged 57,618,000 cu. ft. gas natural, pay 1,456 ft., T.D. 2,045 ft., P.B. 1,461 ft.

North Cowden, Ector County: Texas 24 Holt, 440 ft. from W line and 1,731 ft. from S line Sec. 12, Blk. 43, Twp. 1n, T.&P. Sur., elev. 3,109 ft., pumped 418 bbl. after shot, pay 4,355 ft., T.D. 4,420 ft.

Shipley, Ward County: J. H. Snowden and L. H. Freedman 5-A Wristen, Sec. 18, Blk. 5, H.&T.C. Sur., elev. 2,500 ft., pumped 328 bbl. after acid, pay 2,467 ft., T.D. 3,007 ft.

South Cowden, Ector County: Richmond Drilling 1 Bessie Maurice, 660 ft. from W and S lines of lease, Sec. 32, Twp. 2s, Blk. 42, T.&P. Sur., elev. 2,909 ft., pumped 192 bbl. after shot, anhydrite 1,660 ft., Yates frosted grains 2,940 ft., lime 4,070 ft., pay 4,350 ft., T.D. 4,455 ft.

Waddell, Crane County: Gulf 30 Henderson, elev. 2,781 ft., flowed 1,056 bbl. through tubing after acid, pay 3,305 ft., T.D. 3,578 ft.

Gulf 53 Waddell, elev. 2,763 ft., flowed 8,800 bbl. through casing and tubing after acid, pay 3,250 ft., T.D. 3,484 ft.

Walker, Pecos County: Cardinal Oil 9-J White & Baker, 1,650 ft. from S line and 33 ft. from W line Sec. 85, Blk. 194, G.C.&S.F. Sur., elev. 3,053 ft., dry, T.D. 2,213 ft.

Weiner, Winkler County: Ralph Lowe 3 Brown & Altman, 2,310 ft. from N line and 1,650 ft. from W line Sec. 24, Blk. B-5, P.S.L. Sur., elev. 2,833 ft., flowed 154 bbl. natural through 1-in. tubing choke, anhydrite 745 ft., salt 995 ft., black shale 2,200 ft., lime 2,200 ft., pay 3,024 ft., T.D. 3,154 ft.

J. R. Sharp 1 Halley-Sun, elev. 2,805 ft., flowed 154 bbl. through ¼-in. tubing choke after shot, pay 3,015 ft., anhydrite 720 ft., salt 1,062 ft., black shale 2,160 ft., lime 2,230 ft., pay 3,015 ft., T.D. 3,194 ft.

World, Crockett County: M. & M. Production 10-B Powell, 467 ft. from N and W lines Sec. 62, Blk. BB, E.L. Sur., elev. 2,798 ft., pumped 152 bbl. after acid, pay 2,592 ft., T.D. 2,647 ft.

Interest Maintained in New Andrews County Area

While potential test was being taken at Andrews County's most recent discovery, outposts at other new fields in the county were being watched closely. The new pool opener, Mascho Oil Co. 1 University, Section 27, Block 10, University land, 2 miles northwest of the Emma area, had reportedly pumped 26 bbl. of oil in 2 hours on test preliminary to starting potential. The well had been shot with 310 qt. at a total depth of 4,514 ft.

A slight show of gas between 4,200-4,420 ft. was reported at Atlantic Refining Co. 1-A Texu, Section 9, Block 12, a scheduled 8,700-ft. Ordovician wildcat 12 miles south of the Fullerton area and 13 miles northwest of the M-Bar Ordovician pool opened this month by Phillips Petroleum Co. Atlantic's well had an increase in gas from 4,550 ft. to 4,570 ft. with no oil, and was drilling ahead below 4,720 ft. in hard lime.

Humble Oil & Refining Co. 1 Sims, Section 24, Block A-29, P.S.L. Survey, 13 miles west of the Fullerton pool, was drilling below 6,395 ft. Phillips Petroleum Co. 3 University-Andrews, southwest offset to its discovery at the M-Bar Ordovician pool in Section 31, Block 10, was drilling in lime and anhydrite below 3,370 ft., and ½ mile northwest, Phillips 4 University-Andrews, in Section 30, Block 10, was drilling below 3,360 ft. in lime and anhydrite.

Phillips also had four Permian tests in the West Andrews pool which extends over the M-Bar Ordovician field—the 5, 6, 7 and 8 University Andrews, all drilling at around 4,000 ft.

Magnolia Petroleum Co. and Atlantic Refining Co. each have two rigs running in the area, and Fullerton Oil Co. of Los Angeles filed application to drill three more tests in the new Permian lime field in the northwestern part of the county. Also, Seaboard Oil Co. extended the West Fuhrman area to the west (see completions).

Lamb County Wildcat Goes Deeper

Sulfur water was recovered on a drill-stem test at Stanolind Oil & Gas Co. 1 J. W. Hopping, Section 25, Block T, T. A. Thompson Survey, scheduled 8,500-ft. wildcat in southeastern Lamb County, ½ mile east of the town of Fieldton. On a 30-minute test at 8,140-8,243 ft., 2,150 ft. of sulfur water was taken and operator began drilling ahead.

Wildcatting Moves North

Wildcatting in search of deep pays moved north from the Andrews County successes to Cochran and Gaines counties. The Texas Co. staked an 8,000-ft. test 9 miles south of the Seminole field, the 1 J. B. Robertson, northeast corner of the west 480 acres of Section 25, Block A-21, P.S.L. Survey, in Gaines County. John J. Redfern, Jr., located 1 Wright, 660 ft. from the north and west lines of Labor 2, League 95, Mills C.S.L. Survey, 2½ miles west of Sunray 1 Wright, recently completed pool opener 4 miles north of the Slaughter pool, in Cochran County. Another Gaines County test was Argo Oil Corp. 1 H. B. Granberry, 660 ft. from north and west lines of Section 4, Block A-9, P.S.L. Survey, 8 miles northeast of New Mexico's Hobbs field.

NORTHERN WEST TEXAS COMPLETIONS

Wildcats

Andrews County: Magnolia 1-11-37 Ralph, 660 ft. from S and E lines Sec. 11, Blk. A-37, P.S.L. Sur., elev. 3,393 ft., flowed 336 bbl. through ¾-in. tubing choke after acid, T.D. 7,403 ft., P.B. 7,306 ft., *southwest extension of Fullerton area.*

Seaboard 1-F M. A. Thornberry (formerly No. 3), 1,994 ft. from W lines and 660 ft. from S line Sec. 13, Blk. A-42, P.S.L. Sur., elev. 3,233 ft., flowed 66 bbl. through tubing on gas lift after acid, anhydrite 1,650 ft., salt 1,820 ft., Yates frosted grains 2,900 ft., brown lime 3,970 ft., San Andres 4,387 ft., pay 4,414 ft., T.D. 4,594 ft., *west extension to Fuhrman area.*

Nolan County: Hose and Metcalf 1 Tipton, old well, in 1941 went in to plug and made flow when shot, then went dead, well plugged.

Fields

Emma, Andrews County: Skelly 3-F University, 330 ft. from W and S lines NW Sec. 42, Blk. 9, University Sur., elev. 3,161 ft., flowed 193 bbl. through ⅝-in. tubing choke after acid, pay 4,195 ft., T.D. 4,280 ft., *east edge well.*

Iatan, Howard County: Mid-Continent 5 Denman, 990 ft. from S line and 1,650 ft. from E line Sec. 10, Twp. 1s, Blk. 30, T.&P. Sur., elev. 2,278 ft., pumped 270 bbl. after shot, pay 2,640 ft., T.D. 2,880 ft.

Fleming 3-B Snyder, elev. 2,277 ft., pumped 168 bbl. after acid and shot, T.D. 2,882 ft.

Slaughter, Hockley County: Honolulu 15 Frazier, 595 ft. from N line and 495 ft. from E line Sec. 10, Blk. X, P.S.L. Sur., elev. 3,501 ft., flowed 1,250 bbl. through 2½-in. casing outlet after acid, pay 4,875 ft., T.D. 4,975 ft.

Honolulu 31-B Slaughter, elev. 3,525 ft., flowed 1,001 bbl. through 2½-in. casing after acid, pay 4,920 ft., T.D. 5,010 ft.

Humble 3 Coons, 3,679 ft. from N line and 530 ft. from W line Sec. 11, Blk. X, P.S.L. Sur., elev. 3,521 ft., flowed 977 bbl. through casing after acid, pay 4,915 ft., T.D. 5,015 ft., P.B. 5,005 ft.

Magnolia 17-E Mallett, 580 ft. from N and E lines, Lab. 12, Lge. 49, Scurry C.S.L. Sur., elev. 3,596 ft., flowed 1,706 bbl. through 3-in. casing after acid, pay 4,960 ft., T.D. 5,008 ft.

Western States 20 Frazier, 440 ft. from N line and 550 ft. from W line Sec. 9, Blk. X, P.S.L. Sur., elev. 3,542 ft., flowed 1,065 bbl. through casing after acid, pay 4,982 ft., T.D. 5,033 ft.

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LOUISIANA GULF COAST

Castell Area Test Logs Favorable Showings

By F. L. SINGLETON

NEW ORLEANS, La. — The Louisiana Gulf Coast district had promise of another new discovery as Humble 2 Continental Land & Fur Co., located in the Castell area, Terrebonne Parish, logged favorable showings. An electrical survey showed oil sand with 2½ ohms resistivity at 9,565-87 ft., and the well is drilling ahead in shale below 10,145 ft. This is the first showing to be logged by electrical logging, although a showing of oil was indicated by mud analysis at 4,865-85 ft. The well is situated in 24-18s-12e, on a geophysical prospect consisting of several thousand acres.

In the meantime Superior 1 La Terre, Inc., located in the same parish and about 17 miles to the southeast in the Jug Lake area, is drilling below 11,765 ft., at which depth a protection string of 7-in. casing was cemented. This well is regarded as a prospective pool opener, and the casing was cemented as protection in view of two sand sections logged by an electrical survey. These sands were logged at 9,943-52 ft., and at 10,187-10,252 ft. Side-wall cores in the lower sand recovered sand showing oil and gas. The well is one of several deep tests drilled in the area and correlation with previous development is reported to have placed the well about 260 ft. structurally high.

Texas 2-B Le Danois Land & Stone Co., located on the extreme southwest flank of the Pine Prairie dome, Evangeline Parish, was being watched with interest as it is drilling ahead in sidetracked hole below 9,100 ft. This well was originally drilled to a total depth of 9,490 ft., and reports the past week reveal that sand in the Sparta formation at 9,440-85 ft. showed oil and gas. While attempting to cut side-wall cores, mechanical trouble developed and the hole had to be plugged back and sidetracked.

On the north flank of the Anse La Butte dome, St. Martin Parish, Stanolind 1 J. C. Nickerson, 43-9s-5e, is bottomed at 8,902 ft. where 7-in. casing was cemented. While little information has been released, casing is reported to have been cemented as a protection string and the well is expected to be drilled deeper. This is the deepest test drilled on the north flank of the structure, although possible production from deeper sands were indicated by a deep test on the extreme southeast flank.

Blowout May Cause Abandonment

Mechanical trouble resulting from a blowout in the Lake Arthur area, Cameron Parish, may result in the abandonment of Superior 1-D Miami Corp. in 34-1s-5w. This well was reported the previous week as logging gas sand at 9,949-71 ft., and at a total depth of 10,453 ft., excessive gas pressure developed. The well was finally brought under control, although the drill stem was cemented in the hole. At the end of the week the drill stem was being cut and pulled at a total depth of 2,600 ft. Whether the hole will be sidetracked is not known.

The outcome of Sun 1 Belle-State, located on the Belle Isle dome, St. Mary Parish, is expected to be determined within the next several days. Total depth of the well is below 11,000 ft., and it is temporarily shut down after running an electrical survey, results of which were not available. Gas-distillate production was opened by the company in 1940 at approximately 9,800 ft., and since that time development has been confined to shallow tests. The present well is the deepest to be drilled around the flanks of the structure.

Stanolind 1 Dohmann, about 1½ miles northeast of the Lewisburg field in St. Landry Parish, is reported to have been temporarily abandoned after a series of drill-stem tests through perforated casing at intervals from 10,600-10,700 ft., tested gas, distillate and salt water. The section tested was several hundred feet deeper than the discovery pay in the field, and in view of the abandonment of the same company's 1 Wimberly, situated about midway between this well and the field proper, indicates that the outpost is located on a separate structure.

Although not confirmed, casing is reported to have been cemented in Danciger Oil & Refining Co. 1 Dendinger, Inc., a wildcat located in Livingston Parish. Total depth is reported to be below 10,400 ft., with the casing cemented at approximately 7,500 ft. No shows have been reported,

(Continued on Page 90)

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North La Ward Well Indicates That Lower Pay Blankets Area

By F. L. SINGLETON

HOUSTON, Tex.—The potentiality of the North La Ward field, Jackson County, was increased considerably the past week with the completion of Glenoria Oil Co. 3 Olsvosky which is flowing at the rate of 96 bbl. of pipe-line oil daily through a ¼-in. choke from perforated casing opposite oil sand at 5,626-34 ft., and 5,638-49 ft. The significant feature of this completion is that it provides an extension of approximately 8,000 ft. southeast to the new pay recently opened by Magnolia 15 Gordon. This sand section is approximately 400 ft. deeper than the discovery Frio pay at 5,200 ft., and it now appears that the deeper pay also blankets the entire structure. North La Ward is generally considered as one of the most important oil reserves opened in the district the past year as early development indicated the producing area to extend over several thousand acres. Thus far development is typical of other Frio sand discoveries in the county and additional producing sands can be expected to be opened before development is completed.

New Sand at Ganado

While the above well was being completed, another producing sand in the Ganado field, Jackson County, was being opened by Humble 5 Maggie Branch, a west outpost which is flowing at the rate of about 7 bbl. of oil per hour through ⅛-in. choke while testing through perforated casing opposite sand at 5,800 ft. The well failed to find production in the 6,400-ft. pay, and was plugged back and tested after an electrical survey showed favorable indication. Production on this structure was originally opened at approximately 5,100 ft. However, most production from this sand was gas-distillate and later development opened other sands at 5,500 ft., and 6,400 ft., which has been the main objective in recent development.

Continental 1 Gabitzsch, located near the town of Cistern, northwestern Fayette County, is expected to be completed for a gas well in the Wilcox at 2,808-23 ft. where a drill-stem test showed 405 lb. working pressure and recovered 270 ft. of gas-cut mud with a trace of oil. Additional tests were made at 2,183-95 ft., 1,930-38 ft., both recovering fresh water, and at the close of the week the crew was attempting to retest in the 2,800-ft. pay. While gas production is expected, the showing of the well is of special interest to the Wilcox trend and will enhance further development along the updip sector.

Humble 1 Goolsbee, a Wilcox test located 2½ miles north of Warren, Tyler County, continues to attract attention as it drills ahead in shale below 7,900 ft. Additional showings was logged in the Wilcox formation at 7,694-7,711 ft., but drill-stem testing failed when the seat of the testing tool slipped. Shale with thin sand streaks with an oil odor was cored at 7,711-19 ft., and a 24-minute drill-stem test at 7,699-7,719 ft., recovered 70 ft. of oily mud and 90 ft. of salt water. The Wilcox was topped the previous week at 7,464 ft., and showings of oil and gas have been logged up the hole at 7,481-7,536 ft., and 7,536-38 ft., and 7,633-38 ft. Drill-stem testing in this section recovered some oil and salt water. While the recovery of salt water in these sands is discouraging, the showings are sufficient to encourage further development in the area regardless of whether additional sands are logged deeper in the section.

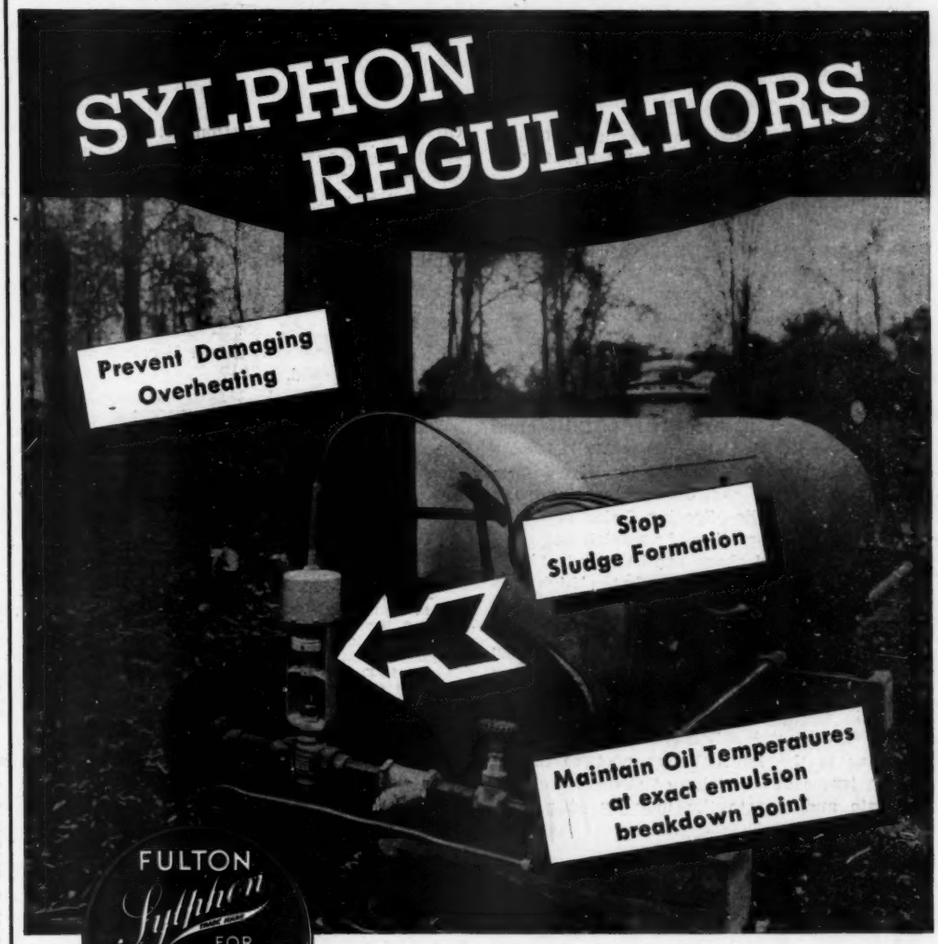
H. C. Cockburn 1 A. E. Quinn, a wildcat located 1½ miles southwest of Randon, Fort Bend County, has reached a critical stage as it drills ahead in shale below 7,139 ft. The Textularia Hockleyensis was topped at 6,453 ft.

Humble Area Wildcat Reports Tops

In Harris County, and located in the Humble area, H. M. Christie 1 Foster Lumber Co. topped Marginulina Cocoensis at 6,287 ft., Massilina Pratti at 6,382 ft., Hockleyensis 6,413 ft., Cockfield 7,395 ft., Discorbis Yeguaensis 7,604 ft., and the well is drilling in shale below 7,650 ft. In the meantime, a new wildcat operation was being started in the general area as H. H. Woodward moved in material for L. E. Griffity, 2 miles southwest of Humble in the A. R. Bodman Survey.

A second producer for the South Ganado field, Jackson County, was assured as Gulfboard Oil Co. prepared to test 2 Harmon. Drill-stem test-

(Continued on Page 88)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OKLAHOMA FIELD REPORT

Wilcox Sand Discovery in Noble Co. Reports Good Flow

By CARL HOOT

COMPLETIONS reported for the week in Oklahoma were of a routine nature. Deep Rock Oil Corp. 1 Schultz, NW SW SE 9-22n-2e, which last week discovered Wilcox production in Noble County, filled its tanks in 3 hours at an open-flow rate of 170 bbl. an hour and was shut in the first of this week for pipe-line connections. The well has been watched with considerable interest. Gulf Refining Co. is laying pipe line to the well.

Value of Shallow Wells Should Not Be Overlooked

In the Mounds district of Okmulgee County Garr & McCracken 1 Perkins, NW NW SW 24-16-11, made a comparatively good gasser, flowing 5,000,000 cu. ft. daily from sand at 2,273 ft. An increase in shallow wells is noted over the past few weeks, particularly in Creek, Okfuskee, Okmulgee and other counties where used and repaired equipment can be utilized to the best advantage, thus aiding the conservation program. A 50-bbl. well was completed at 869 ft. in Okfuskee County; a 2,000,000-cu. ft. gas well at 663 ft. was reported in Creek County and in Osage County a Bartlesville sand well pumped 75 bbl. of oil a day from 1,545 ft. It is in these areas that the Fourth District Stripper Well Association of Okmulgee has launched its drive for exceptions to the 40 and 640-acre spacing rules for oil and gas wells. Spacing Order M-68 was set up for the conservation of materials but when good wells as listed above can be found at such shallow depths it is obvious that a high percentage of the materials used can be salvaged for additional wells. Shallow areas in Oklahoma are generally long-lived but their slow drainage and little or no gas pressure makes close spacing necessary to recover oil which would otherwise be left in the ground. Declining production in Oklahoma, where the only major new strike found this year is the Pauls Valley pool of Garvin County, increases the value of stripper wells to the state and also to the industry at a time when the most production must be obtained from a minimum of materials.

Oklahoma County

Seven miles northeast of Edmond, Oklahoma County, Harper & Turner 5 Harper, NW SE NW 17-14-2w, flowed 40 bbl. of high gravity crude from Bartlesville sand at 5,831 ft. to become the third producer in the pool which is as yet unnamed. Location is a northwest offset to the 4 Harper completed early in May. Two other wells have been drilled in this area. The first, in 1935, was Anderson and Kerr Drilling Co. 1 Linn, ¼ mile southwest of the 5 Harper which had a show of oil in sand at 5,860 ft. but was abandoned at 6,373 ft. In 1941 Harper & Turner 1 Houchin, just southwest of the dry hole, was drilled to Bartlesville sand at 5,875 ft., producing 5 bbl. daily of 45.7-gravity oil.

Wildcat Activity

Six miles southeast of Okemah and 3 miles west of the Deaner pool, Okfuskee County, W. C. McBride 1 Replogle flowed 68 bbl. of oil after casing was ripped at 2,915-25 ft. Formations logged were Hunton 3,814 ft., Viola 3,985 ft., Wilcox 4,043 ft. with total depth at 4,047 ft. It was classed as a discovery well. In this same area, 1¼ miles west and ¼ mile north, Alma Oil Co. 1 Replogle, NW SW NW 14-11-10, previously drilled to 3,215 ft., was plugged back to 3,000 ft. and tested but received no shows.

In Marshall County one wildcat was finished and another found a show of oil. The tests are some 2½ miles apart. Samedan Oil 1 Godfrey, NE NE SW 13-6s-6e, a 6,500-ft. test, was drilled to 3,183 ft. and had light stainings in porous sections. On drill-stem test with packer set at 3,106 ft., 90 ft. of drilling mud and 360 ft. of oily gas-cut mud was recovered in 45 minutes. Oil tested 40 gravity. Bottom-hole pressure was 500 lb. Operators were preparing to drill ahead on last report. Northwest of Samedan's test, Marshall et al 1 Burris, SE cor. 4-6s-6e, was dry at 3,794 ft.

Pottawatomie County

The new Brooksville pool of Pottawatomie County had its first failure when Smith Brothers 1 Haas, NW SW 3-8-3, found the Hunton dry at total depth of 4,890 ft. It is a ⅝-mile south outpost from the field.

OKLAHOMA COMPLETIONS

Wildcats

Comanche County, 2 mi. N of Lawton pool: Garr & McCracken 1 Campbell, SE NE 10-2-10w, dry, T.D. 1,690 ft.

Garvin County: Pure Oil 1 Price, SW SW SE 4-3-1, dry, T.D. 4,752 ft., sand 3,724-32 ft., conglomerate 3,835 ft.

Jefferson County: W. W. Woodworth 1 Sullivan, SW NW NE 28-3s-4w, dry, T.D. 2,655 ft., Arbuckle 2,590 ft.

Marshall County: Marshall et al 1 Burris, SE cor. 4-6s-6, dry, T.D. 3,794 ft., Sylvan dolomite 2,065 ft., Trenton 2,149 ft., Bromide 2,340 ft.

Okfuskee County: W. C. McBride 1 Replogle, NE NW SW 13-11-10, flowed 44 bbl., sand 2,915-25 ft., T.D. 4,047 ft.

Fields

Apache, Caddo County: Cities Service 1 Kee-Har-To, NE cor. 11-5-12w, flowed 186 bbl. in 6 hr. through choke, sand 3,912-50 ft., T.D. 4,015 ft.

Brooksville, Pottawatomie County: Smith Bros. 1 Haas, NW SW 3-8-3, dry, T.D. 4,890 ft.

Dilworth, Kay County: West Virginia 9 Fox, SW NE NE 19-28-1, pumped 54 bbl., Wilcox 3,340-48 ft., 40 gravity.

Hotulke, Pottawatomie County: R. Olsen Oil Co. 1 Trice, SE NE 23-9-4, flowed 220 bbl. through choke, Hunton 4,248-68 ft.

Oklahoma City, Oklahoma County: Ellison & Diehl 1 Estes, SE NW SW 22-12-3w, pumped 363 bbl., Wilcox 6,463-6,548 ft.

Pauls Valley, Garvin County: Pure Oil 2 Teter, SE NW SW 31-4-1, flowed 528 bbl. in 4 hr., 7,800,000 cu. ft. gas, through choke, sand 3,935-4,004 ft., T.D. 4,014 ft.

Miscellaneous

Creek County: Indo Oil 1-A Sesson, NW NW SW 5-16-12, dry, T.D. 2,538 ft.

Gauer et al 2 Dressler, NE NW SE 16-17-8, flowed 3 bbl., 1,647-68 ft., T.D. 3,440 ft.

A. D. Whitten 1 Jack, NW SW SE 8-18-12, 1,750,000 cu. ft. gas, Big lime 651-63 ft.

Okfuskee County: W. R. Staples 1-A fee, SE NW 13-12-11, pumped 50 bbl., sand 841-69 ft.

Wells et al 1 Harris, NE SW 25-10-11, dry, T.D. 3,196 ft.

Oklahoma County: Hall-Briscoe 1 King, NE SE 28-13-1, dry, T.D. 5,112 ft.

Harper-Turner 5 Harper, NW SE NW 17-14-2w, flowed 40 bbl., Bartlesville sand 5,831-62 ft.

Okmulgee County: Garr & McCracken 1 Perkins, NW NW SW 24-16-11, 5,000,000 cu. ft. gas, sand 2,273-2,360 ft., T.D. 2,760 ft. in Wilcox.

Osage County: Dunn & Miller 1, SW cor. 30-24-11, pumped 75 bbl., Bartlesville sand 1,545-1,655 ft., T.D. 1,764 ft.

Ida Robinovitz 1, NW NW SE 25-22-9, dry, T.D. 2,662 ft.

Seminole County: McIntyre et al 1 Miracle, NW SE SE 14-9-7, disposal well, T.D. 3,515 ft.

Phillips 1 Lillie, SW NE NW 15-6-5, dry, T.D. 3,325 ft.

Recompletions

Okfuskee County: Texas 1 Randall, NE NW NW 8-11-10, 6,000,000 cu. ft. gas, sand 2,985-3,005 ft., old T.D. 3,735 ft., P.B. 3,015 ft., and perf.

Alma Oil 1 Replogle, NW SW NW 14-11-10, dry, T.D. 3,215 ft., P.B. 3,000 ft.

Seminole County: Commercial Drlg. 1 Harjo, SE cor. 23-9-6, pumped 5 bbl., old T.D. 4,137 ft., P.B. 3,440 ft.

California Fields

(Continued from Page 80)

ency to expand up to date and there is a strong probability that the original field existed in the northern area with migration under pressure to the southern end of the nose. Obviously, if R. S. Lytle gets a Gatchell zone well in the Quijarral Hills it may represent a major discovery. It is too early to give this well a chance for production but the next 100 ft. of hole may uncover additional oil sand. The Gatchell oil sand is of Eocene age and is the best sand of this age in the state. The Eocene is also productive in the Ketleman North Dome field but as in the northern end of the Coalinga Nose field it shows an exceptionally high gas-oil ratio.

Antelope Plains Discovery Shows Water

The Antelope Plains field where Shell Oil Co., Inc., discovered commercial production a few weeks ago took on a shady look this week when the discovery well began cutting 15 per cent water. It has not been determined whether this is due to a defective water shutoff or whether it is formation water or edge water. The sudden and unexpected appearance of water in this well tends to indicate the water shutoff may have proved ineffective as it came in quickly in contrast with edge water which feathers in as oil is produced. Not enough crude oil has been produced in this well to allow water to finger in. In the meantime, Shell is progressing with the drilling of a second well which if present plans are carried out will be a deep test. This second well has not found the Williams oil sand although it is now substantially deeper than the discovery well. This tends to indicate the probability that the productive acreage in the Antelope Plains field will extend to the west and northwest. No deep tests have been drilled west of the discovery well although deep wells have been drilled east and south without finding a sufficient amount of oil sand to produce.

SAN JOAQUIN VALLEY COMPLETIONS

Belridge, North, Kern County: Belridge Oil Co. 47-27 fee, 27-27s-20e, flowed 1,224 bbl., 33.2-gravity, 0.2 per cent cut, 789,000 cu. ft. gas, 96/64-in. bean, pressures 150/950 lb., T.D. 9,637 ft., P.B. 8,591 ft., completed barefoot as no liner landed below shoe of 5⅞-in. water string at 8,505 ft., production coming from a probable new productive interval 8,545-80 ft., Eocene in age.

Belridge, South, Kern County: General Petroleum Corp. 8-A Belridge, 3-29s-21e, pumped 130 bbl., 14.4-gravity, 5 per cent cut, T.D. 913 ft., perf. 468-814 ft., 836-900 ft., completed in upper zone of Pliocene age.

Midway-Sunset, Kern County: General Petroleum Corp. 351-35 Moco, 35-12n-24e, pumped 50 bbl., 13.4-gravity, 15 per cent cut, T.D. 945 ft., perf. 510-944 ft., completed in upper shallow zone of Pliocene age.

Standard Oil Co. 97-35-B fee, 35-31s-23e, pumped 119 bbl., 29.1-gravity, 5 per cent cut, T.D. 3,250 ft., 60-mesh perf. 2,995-3,249 ft., scalez zone 2,670 ft., mulinia zone 2,713 ft., completed in so-called gusher zone of Pliocene age.

Mount Poso wildcat district, Kern County: Alpha Oil Co. 1 Elliott, 1-27s-28e, abandoned in basement granite, T.D. 1,320 ft., redrilled to 1,000 ft., Vedder zone of Miocene age was barren at this location.

Alpha Oil Co. 1-A Elliott, 1-27s-28e, abandoned as dry hole at 1,370 ft., Vedder zone of Miocene age was barren at this location.

Petaluma wildcat district, Sonoma County: Standard 2-1 Petaluma Community, 9-5n-7w, abandoned in basement basalt, T.D. 1,631 ft., no commercial showings in Cretaceous age.

Tulare wildcat district, Tulare County: Richfield Oil Corp. 1-1 Tulare Community, 33-19s-24e, abandoned in basement slate, T.D. 5,356 ft., no major showings of oil or gas logged basement slate 5,347-56 ft.

Lawrence Co. Wildcat Finds Tully Lime Regionally High

PITTSBURGH, Pa.—In Southwest Pennsylvania a deep test topped the Tully lime (Middle Devonian) and it appears running regionally high; there was a good oil show in the Big Dunkard (Pennsylvanian) about 13,000 ft. east of production in Greene County and on the eastern edge of Washington County, a good Injun sand well. In West Virginia operations were mostly routine and small in results.

SOUTHWEST PENNSYLVANIA

In Lawrence County, John T. Galey et al topped the Tully lime at 4,344 ft. in the test on the Miller and Myers lease in Slippery Rock Township and is shut down to cement account of caving at 4,467 ft. This test is running about 38 ft. higher, steel-line measurement, than the nearest deep test on the Heickel farm.

On the Fayette anticline in South Huntington Township, Fayette County, Peoples Natural Gas Co. is drilling at 7,903 ft. in the test on the Jacobs Creek Oil Co. or 586 ft. below the top of the Onondaga lime. The formation has now changed from Onondaga chert to limy shale which could be the shale break above the Oriskany cap rock as has been found in Maryland or on Chestnut Ridge, but not in all wells, or an entirely different story, as the Onondaga section is several times thicker than any in Southwest Pennsylvania.

On Chestnut Ridge in South Union Township, Fayette County, Peoples Natural Gas Co. struck a fair volume of gas (about 500,000 cu. ft.) in 6 Piedmont Coal Co. at 2,897 ft., 2,900 ft., and 2,935 ft. in sand and shells which at 2,959 ft. is still holding up. No such volume of gas has been found in any of the other wells on the structure at that depth or a correlative depth. This company is drilling 1 Walters at 668 ft. New Penn Development Co., William E. Snee et al cleaned out 2 Heyn and then acidized the Oriskany sand and are still bailing water. No test has been made. The gas from 1 Kirby (about 85,000 cu. ft.) from the Onondaga chert and none from the Oriskany, has been turned in the line for test. Greensboro Gas Co. is drilling 2 Barton at 389 ft. and building rig for No. 3.

On Laurel Ridge in Ligonier Township, Westmoreland County, New Penn Development Co., William E. Snee et al are drilling the deep test on the John and Eleanor Beck farm at 840 ft. with markers so far confirming the surface work done.

In Maryland William E. Snee et al have reached 5,300 ft. in the test on the George Georg farm on the Accident dome in Garrett County.

SOUTHWEST PENNSYLVANIA COMPLETIONS

Armstrong County, Boggs Township: John Wray et al 1 Miles Calhoun, 50,000 cu. ft. gas, Bradford sand, T.D. 3,100 ft.

Burrell Township: T. E. Rosensteel & Son 2 J. A. Beck, 348,000 cu. ft. gas, Thirty-foot sand 1,479-1,525 ft., gas 1,485 ft. and 1,503 ft., T.D. 1,527 ft.

Clarion County, Clarion Township: Ralph Thompson et al 3 John Guiher, dry, T.D. 2,570 ft.

Monroe Township: Owens-Illinois Glass Co. 3 Scott Barnhart, 363,000 cu. ft. gas, Thirty-foot sand, T.D. 1,160 ft.

Red Bank Township: Owens-Illinois Glass Co. 2 Newton Miller, dry, through Tiona, T.D. 3,312 ft.

Owens-Illinois Glass Co. 2 Samuel Hetrick, 35,000 cu. ft. gas, Bradford sand, T.D. 3,200 ft.

Fayette County: Brummage & Brummage 1 Minor Hartley, 212,000 cu. ft. gas, Gantz sand 2,462-2,520 ft., gas 2,501-07 ft., T.D. 2,689 ft.

Springhill Township: William Dodds et al 1 Thomas Caseber, 176,000 cu. ft. gas which blew down to 20,000 cu. ft., Big Injun 1,170 ft., gas 1,292 ft., T.D. 1,382 ft.

Greene County, Monongahela Township: Pittsburgh Steel Co. 3 fee, 30 bbl., T.D. 652 ft., Big Dunkard 626 ft.

Cumberland Township: Greensboro Gas Co. 1 J. C. Hartley, 39,000 cu. ft. gas, Elizabeth sand 2,815-23 ft., gas 2,815-20 ft., T.D. 2,888 ft.

Washington County, Nottingham Township: Mingo Gas Co. 1 John Gamble, old T.D. 1,379 ft., Big Injun sand 1,540 ft., 1,961,000 cu. ft. gas at 1,593 ft., T.D. 1,598 ft.

WEST VIRGINIA

In Meade district, Tyler County, the test of Benedum & Trees is cementing at 5,965 ft. 1 Pearl Broadwater. The tools were lost at 5,990 ft. In Ritchie County these operators have reached 5,200 ft. in the test on the L. J. Rinehart farm in Grant district. In Union district, Pleasants County, their test on the W. W. Campbell farm is drilling at 960 ft. Their fourth deep test on the Park Smith farm in Spring Creek district, Wirt County, is now rigging up.

Added to those four deep tests, all by the same interests and well scattered, is now added a fifth. It is a test on the H. G. Criner farm in Reedy district, Roane County, about ½ mile east of Billings (Kriger). It starts at an elevation of 950.12 ft.

(Continued on Page 92)

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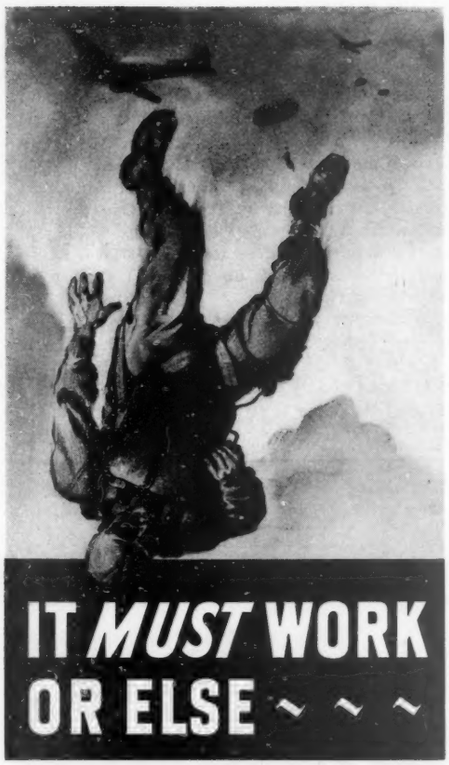

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SOUTHWEST TEXAS

New Sand and Extension Found in Seeligson Field

By F. L. SINGLETON

CORPUS CHRISTI, Tex.—While the outcome of a scheduled production test of a prospective Wilcox sand pool opener in Wilson County was awaited, several other important developments were being recorded in the Southwest Texas district. These included a new sand discovery and an important extension to the Seeligson field, Jim Wells County, opening of prolific gas-distillate production from a new and deeper sand in the old Refugio field, Refugio County, two new discoveries in Starr County and the testing of two shallow wildcats in Starr and Webb counties.

The Seeligson structure, southern Jim Wells County, one of the largest oil reserves in the district, was being extended into Kleberg County by Humble 1 King Ranch, A. King Survey, approximately 3,900 ft. northeast of the nearest production. Sand and sandy shale showing oil and gas was cored at intervals from 4,640-69 ft., and the well is coring ahead in sand following a second drill-stem test at 4,652-69 ft., which tested 2½ lb. working pressure and recovered 3,800 ft. of pipe-line oil. An earlier test at 4,638-49 ft., recovered 130 ft. of oil and 130 ft. of oily mud. In view of the fact that the sand was logged several hundred feet higher than the shallowest sand in the Seeligson field proper at 5,200 ft., it is possible that the well is located on a separate structure, however, this will not be determined until after the well has been drilled to its projected depth of 6,500 ft. at which time a better correlation can be made. There are several blanket sands extending over the Seeligson structure at intervals from 5,200-6,000 ft., and if these sands are logged the well will be generally considered as a part of the Seeligson field.

New Deep Pay in Old Refugio

The old Refugio field, Refugio County, was thrown open for deep development with the completion of Sunray 6 Mitchell located in the southern portion of the field, generally referred to as Mission River. Production was obtained by perforating casing at 8,430-45 ft., and the well is flowing at the rate of 220 bbl. of distillate daily through various chokes. While the well was drilled tight and geological markers are not available, the production is believed to be from the basal Frio. The deepest production heretofore had been at approximately 6,500 ft.

In the same county, and located in the new Rooke field, Plymouth 1-E Welder, about 2,000 ft. northeast of the discovery well, is reported to have topped the main sand at 7,120 ft., and the well was being tested through perforated casing at 7,121-25 ft.

Another interesting well in the Lower Gulf Coast district is Sinclair Prairie 1 A. J. Bickford, located on the extreme east side of the depleted Port Lavaca field, Calhoun County. The well was drilled below 8,800 ft., and at the close of the week the hole was being plugged back to test at 8,100-8,200 ft., where an electrical survey and side-wall cores are reported to have shown favorable indications. Seven-inch casing was recently cemented at 8,847 ft., and it is possible that other sands have been logged.

Additional development on the east side of the Orange Grove field, Jim Wells County, is expected following the completion of Kilgore Developers 1 Bertha Stratmann, 1 mile from production. Total depth of the well is 5,790 ft., and the well is shut in after flowing an unestimated amount of gas and distillate from perforated casing opposite sand at 5,074-78 ft. In line with this development and 1 mile northwest of the Magnolia field, Hickok & Reynolds were moving in for 1 Reynolds & Richardson, in the W. O. Staples Survey.

Wildcatting in Duval and Nueces Counties

New wildcat activity was reported in Duval and Nueces counties. Three of the new operations were Pettus sand tests in Duval County. These include Continental 80-A Clara Driscoll, 1 mile north of the Driscoll field, Hiawatha 1 Halff, 5 miles northeast of Benavides, J. Poitevent Survey, Guy I. Warren 4 Clara Driscoll, 6 miles north of the Driscoll field, Santa Rosalia Survey. In Nueces County, a 7,000 ft. test is being started by F. A. Gillespie et al on the J. F. Balland lease, 6 miles east of Bishop in the P. Farias Survey. The location is about 7,000 ft. southeast of Wellington 1 Michalk, a dry hole. Two miles southwest of Clarkwood, Las Tecas Petroleum Co. spudded 2 Jalufka in the O. M. Allen Survey.

Along the Starr County sector of the Frio-Vicksburg trend, Sun Oil Co. continued to test two wildcats and both were showing promise of opening small production. About 1½ miles south of the Rincon field, 2-A Frost National Bank was being rigged up to pump, after it showed considerable oil while testing through perforated casing at 4,181-83 ft., 4,187-91 ft. Whether this is an extension to Rincon will be determined by further development. Three miles due north of the Sun field, 1-A Montalvo was swabbing a small amount of oil while testing at 6,090-6,131 ft.

Five miles east of Rio Grande, Otto Woods 1-A Bass is bottomed at 1,984 ft., with 4-in. casing cemented at 1,970 ft., preparatory to testing sand at 1,964-67 ft., where a drill-stem test recovered oil-cut drilling mud.

Approximately 1½ miles southwest of the Moca field, Webb County, Magnolia 1 Duval County Ranch Co., Zapata County School Land Survey, was drilled to a total depth of 2,638 ft., and 7-in. casing was cemented at 2,022 ft. An electrical survey and side-wall cores showed sand with an oil odor at intervals from 1,952-70 ft.

Holland Oil Co. 1 Boysen, located 5 miles northeast of the town of Poth, Wilson County, was reported to be in the process of completion, but no report had been received. Seven-inch casing was cemented at 4,177 ft., and the well was to test sand at 4,155-59 ft. and 4,090-98 ft., where a drill-stem test in the Wilcox recovered 360 ft. of 26.8-gravity oil. The outcome of this test is being watched with wide interest as it will have much bearing on future exploration through a large portion of the old Balcones fault-line district.

SOUTHWEST TEXAS COMPLETIONS

LOWER GULF COAST DISTRICT

Fields

Agua Dulce, Nueces County: Pan American 3 Aetna Life Ins., 130 bbl., ⅛-in. choke, perf. casing 6,419-33 ft., T.D. 6,449 ft.

L. M. Lockhart 4 Winfield, 40 bbl. distillate, ⅛-in.

(Continued on Page 92)

Smackover Well in Limestone County Abandoned

By ROBERT INGRAM

DALLAS, Tex.—Abandonment of the Texas Co. 1 W. A. Keeling, Whitaker Survey, Limestone County (see completions), threw no cold water on the Smackover lime pay in East Texas last week. Rather, interest in the play was stepped up. Reason: The entire play is a long-range, widespread search for a shoreline trap in the Smackover section, and while the Texas Co. well found no pool, it did narrow the probable zone in which the shoreline would be found.

The operator gave out no information, and succeeded in drilling the hole so "tight" that even the drilling crew admitted it had been completely in the dark as to tops and other information. Nonetheless, it was reliably reported (1) that the well had over 100 ft. of Smackover section; (2) that there was some saturation in the top of the section; (3) that granite was topped at 6,014 ft. and drilled 4 ft. to total depth.

Presence of the Smackover at the Keeling location pegged the eastern zone of prospecting for the shore line in that immediate vicinity, narrowed it considerably from the former eastern limits determined in 1938 by Stanolind Oil & Gas Co. 1 Norris on the Thornton fault structure in Limestone County, which topped the Reynolds lime, top member of the Smackover section, at 8,525 ft. Existence of the shore line, assumed because the Smackover is known to be a blanket formation extending throughout the Woodbine basin into southern Arkansas with no outcrop anywhere, had previously been established by the Stanolind well and wells a little to the west which had gone into granite from the Pettit at around 4,750 ft. with no Smackover section at all.

Depth of the Smackover at the Keeling well was well within the depths at which production from that section is found in southern Arkansas. Operator made a drill-stem test with packer set at 5,715 ft., but the seat gave away in 3 minutes and recovery was only 90 ft. of mud with no show.

Another Test Planned

Meantime, it was generally believed that the company would make another test soon on its 80,000-acre block in the county, would also drill elsewhere along the trend where it had taken a total of some 200,000 acres in blocks extending as far north as Dallas County. Also, from Waxahachie, Tex., came the announcement that the Texas Co. had assembled a second big block—this one about 60,000 acres from the community of Emhouse in northwestern Navarro County some 40 miles to Lawson, north and east of Seagoville in Dallas County, and running across Ellis County.

To the west, just across the Limestone County line in McClennan County, Mae Belcher et al of Fort Worth completed a deal to drill on the northeast part of the W. F. Chapman Survey. This well is to go to 4,500 ft., is to test upper zones, including the Woodbine, and will seek the Smackover section. Drilling contract has not been let, but operators hope to start by June 15.

On the northern rim of the basin, where the shore line probably runs westward toward Arkansas, Tide Water Associated Oil Co. and Seaboard Oil Corp. were reported to have taken a 7,000-acre block. This was in southern Franklin County, and may lie south of the general trend although it was believed to taken in search of the Smackover. There was also the wildcat staked by Grady Vaughn, Dallas operator. The Vaughn test has been tentatively staked on the W. H. Jackson 174-acre tract in the James E. Hopkins Survey in the northeast corner of Franklin County and north of the Talco fault zone, and is to go to the deep-lime zone.

Second Wildcat at Kildare

Second producer was brought in for the Kildare Rodessa Glen Rose lime pool of southern Cass County, ¼ mile north of the discovery. It was C. C. Gilger 1-A Groggan, Watson Survey, which gaged 280 bbl. in 24 hours through 5/64-in. tubing choke from 6,012 ft. to total depth of 6,050 ft. Gilger was clearing site for 1 Cass County School Lands, a west offset to the new well which was already moving production through the Gulf Refining Co. connection. Phillips Petroleum Co. 1 Benefield & Singleton, Wanhop Survey, east offset to the discovery, set surface pipe at 700 ft. after completing a fishing job, and Hollandsworth Drilling Co. 1 Benefield & Singleton, also

(Continued on Page 90)

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NORTH CENTRAL TEXAS

Outpost to K.M.A. Field Shows Oil in Regular Pay

By ROBERT INGRAM

WICHITA FALLS, Tex.—Oil was showing at Grace & Grace 1 Dorris, Section 4, H.T.&B. Survey, 3 miles southwest of Iowa Park in Wichita County, an outpost to the K.M.A. field. The well drilled sand showing oil at 4,158-78 ft. and had a hole full of oil at week's end. Operators were cleaning out and hoped the well would flow after it was conditioned.

The previous week, the well tested 6 gal. of oil an hour from sand at 4,102-10 ft.

Marble Falls Discovery Gaged

Potential was taken last week on Sinclair Prairie 1 Jones, I. Singletary Survey, 1 mile east of Forrestburg in Montague County. The well, first Marble Falls lime producer in that portion of the Fort Worth basin, flowed 888.43 bbl. of oil and no water in 9 hours through open tubing. During the last hour, tubing pressure was zero, casing pressure, 600 lb. The well had been retreated with 8,000 gal. of acid in the pay at 7,176-7,236 ft., with a plugged-back total depth of 7,320 ft.

Wildcat Progress

Continental Oil Co. 1 Penn, Block 59, A. E. Topper Survey, Montague County, topped Simpson section at 6,922 ft., drilled porous lime with slight showings of oil from 6,923-31 ft. and was drilling in brown lime below 6,962 ft. Rankin & Elliott 1 Sanders, Block 1963, T.E.&L. Survey, Young County, drilled gray lime, probably Caddo, showing oil from 4,003-28 ft. and from 4,074-83 ft., total depth, then set 5½-in. casing at 4,071 ft., drilled plug and were testing. Joe Worsham 1 Hensley, T. Martinez Survey, 7 miles south of Jacksboro, southern Jack County, drilled oil sand from 5,047-50 ft., then drilled ahead and was below 5,085 ft.

NORTH TEXAS COMPLETIONS

Wildcats

Archer County: W. E. Production 1 Ada Anderson, NE Lot 8, G. P. Meade subd., L. M. Pasture. 2 mi. NE of Megargel, pumped 68 bbl., sand 1,452-62 ft., T.D. 1,462 ft., *discovery.*

Young County, Kimbell & Bohner 1 A. L. Harris, NW of E 40 acres of N 80 acres Sec. 60, J. W. Harris subd., 8 mi. SW of Archer City, dry, T.D. 1,384 ft.

Clay County: L. T. Burns 2 H. C. Edrington Est., 949 ft. from S line and 1,320 ft. from W line of lease in C. H. Stearns Sur. A-872, dry, TD. 1,439 ft.

Grayson County: Talbot & Fenston 1 Jewell, William Allen Sur. A-15, 8 mi. NE of Whitesboro, dry, sand lime with slight show of oil 7,168-7,209 ft., T.D. 8,400 ft.

Montague County: D. C. Allen 1 S. Y. Robinson, SE NW Sec. 3, Limestone C.S.L. Sur. A-421, 6 mi. SE of Bowie, dry, T.D. 901 ft.

Wichita County: Ted A. Norwood et al 2 C. Guyer 1,040 ft. from N line and 330 ft. from E line of A. Bingham Sur. A-16, 8 mi. NE of Wichita Falls, dry, T.D. 1,235 ft.

Fields

K.M.A.-Ellenburger, Wichita County: Deep Rock 2-E Hamilton, 683 ft. from E line and 1,787 ft. from S line of 137-acre lease in E. Durain Sur. A-53, pumped 158 bbl., pay 4,258-4,300 ft., T.D. 4,300 ft.

Mul-Berry Oil 1-E Bradley, 330 ft. from S line and 741 ft. from W line of U. G. Gahagan Sur. A-456, 2½ mi. NW of Kamay, flowed 554 bbl., pay 4,198-4,310 ft. after acid, T.D. 4,310 ft.

Sunray Oil 15-E Anna Mangold, SE Lot 39, P. Castleman Sur. A-35, 2 mi. SW of Kamay, flowed 1,320 bbl. natural, pay 4,289-4,321 ft., T.D. 4,321 ft.

Markley, Archer County: Boyle & Stine 3 J. R. Garvey, 950 ft. from N line and 700 ft. from W line Sec. 2, B.B.B.&C. Sur. A-841, pumped 24 bbl., pay 779 ft., T.D. 795 ft.

New York City, Clay County: Shell 3 Willis, Blk. 5, T.&N.O. Sur. A-678, dry, Caddo 5,992 ft., Mississippian 6,342 ft., Ellenburger 6,647 ft., T.D. 6,656 ft.

Petrolia, Clay County: F. H. Gohlke 1 Householder Est.-B, SW N½ Blk. 30, Byers Bros. subd., dry, T.D. 1,849 ft.

Thornberry, Clay County: Johnson & Kouri 5 C. T. Taylor Est.-A, 330 ft. from SW line and 550 ft. from E line of E 80 acres of Lot 45, Bacon subd., pumped 9 bbl., pay 1,140 ft., T.D. 1,147 ft.

Stayton Oil 2 Turner, SW NE Blk. 55, Specht-McCutchen Sur. A-158, dry, T.D. 1,209 ft.

(Continued on Page 93)

Texas Gulf Coast

(Continued from Page 83)

ing in the discovery pay at 5,350-94 ft., tested 90 lb. working pressure and recovered 3,500 ft. of oil. Five and one-half-inch casing was cemented on bottom at 5,394 ft. The well is located about 1,400 ft. west of the discovery well. In view of the fact that the sand was topped about normal with the discovery well, the new pool looms as an important addition to growing list of Frio sand fields in the county, and an expansion of drilling activity is anticipated.

TEXAS GULF COAST COMPLETIONS

Wildcats

Fort Bend County: Mackhank Petroleum Co. 1 J. M. Moore, dry, T.D. 8,015 ft.

Grimes County: H. C. Cockburn 1 Gayle, dry, T.D. 8,734 ft.

Fields

Citrus Grove, Matagorda County: Pure 1 L. Le Tulle, 785,000 cu. ft. gas, 7/64-in. choke, perf. casing 4,210-25 ft., T.D. 4,468 ft.

Dyersdale, Harris County: Jack Frazier 1 Reichardt, dry, T.D. 4,153 ft.

Fig Ridge, Chambers County: Sun 3-A S. W. Pipkin, 170 bbl., ¼-in. choke, perf. casing 8,492-64 ft., T.D. 8,570 ft.

Lolita, Jackson County: Shell 2 Mitchell, 114 bbl., ⅛-in. choke, perf. casing 5,282-90 ft., T.D. 5,294 ft.

Lovells Lake, Jefferson County: Humble 4 Failor, dry, T.D. 7,812 ft.

Livingston, Polk County: Jordan Drilling Co. 1 Sodak Oil Co., 1,000,000 cu. ft. gas, perf. casing 4,167-74 ft., T.D. 4,212 ft.

Mercy, San Jacinto County: Shell 2 Dunnam, 577 bbl., ¼-in. choke, perf. casing 8,274-82 ft., T.D. 8,288 ft.

North La Ward, Jackson County: Glenoria Oil Co. 3 Olsvosky, 96 bbl., ¼-in. choke, perf. casing 5,626-34 ft., 5,638-49 ft., T.D. 5,660 ft.

Gulf 3 J. E. Pickering, 18 bbl., 3 hr., ⅛-in. choke, perf. casing 5,215-21 ft., T.D. 5,220 ft.

Ramers Island, Tyler County: American Republics 2 Cushing fee, dry, T.D. 8,454 ft.

Spindletop, Jefferson County: Stanolind 105 Gladys City, 6 bbl. pumping, T.D. 4,809 ft.

West Ranch, Jackson County: Magnolia 220-A West Ranch, 132 bbl., 7/64-in. choke, perf. casing 5,745-49 ft., T.D. 5,750 ft.

Withers, Wharton County: F. W. Michaux 21-A Pierce, 84 bbl., 5/32-in. choke, perf. casing 5,384-89 ft., T.D. 5,402 ft.

F. W. Michaux 47-A Pierce, 184 bbl., 5/32-in. choke, perf. casing 5,304-18 ft., T.D. 5,351 ft.

Texas 84-B Pierce, 65 bbl., ⅛-in. choke, perf. casing 5,296-5,312 ft., T.D. 5,385 ft.

Texas 107-C Pierce, 118 bbl., ⅛-in. choke, perf. casing 5,338-58 ft., T.D. 5,385 ft.

MICHIGAN OPERATIONS

Big Development Planned For Northwestern Gas Area

By OTTO C. PRESSPRICH

SAGINAW, Mich.—Taggart Brothers Co. of Big Rapids obtained permits from the state Conservation Department last week for five more natural-gas tests to be drilled in Osceola and Lincoln townships of Osceola County after completing another small producer in that area, as well as a larger test in Montcalm County.

Seventeen oil and gas completions were recorded in Michigan for the week, eight burning oil, two natural gas, while the other five tests ended as dry holes, including one in Chapin Township, Saginaw County. The Saginaw test, Miller Brothers 1 Sutliff, got a fair showing of oil but operations failed to develop quantity sufficient for commercializing. Similar procedure was reported by Frank Summers and associates with regard to a wildcat deep test in Springfield Township, Oakland County, which drilled to 4,887 ft.

Two big wells were among the new completions. American Drilling Co. ran 130 bbl. an hour on test of its 1-W State in Section 4 of Franklin Township, Clare County, while in Roscommon's Headquarters field, Pure Oil rated 1-C State in Section 33 at 2,304 bbl. potential.

MICHIGAN COMPLETIONS

Allegan County, Allegan Township: Bridger Basin Oil Corp. 1 Butcher, NW NE NW 26-2n-13w, pumping 10 bbl. and salt water, acidized; T.D. 1,410 ft.

Hopkins Township: Regal Dutch Petroleum Co. 3 Wamhoff, C E½ NW NE 18-3n-12w, pumping 100 bbl., acidized; T.D. 1,557 ft.

Trowbridge Township: Claude Huff 2 Theiner, SW SW NE 21-1n-13w, pumping 25 bbl. and salt water, acidized; T.D. 1,367 ft.

Clare County, Franklin Township: American Drilling Co. 1-W State, C N½ NW SE 4-20n-3w, natural potential 3,120 bbl. (130 bbl. per hr. on test); T.D. 3,339 ft.

Grant Township: Joseph Buzard 1 Sanford, SE SE NW 35-17n-4w; two bbl., acidized; T.D. 1,310 ft.

Lincoln Township: Freeman Oil Co. 1 Liewald, C SW SW NE 16-18n-5w; wildcat test, dry; T.D. 4,025 ft.

Winterfield Township: Cities Service Oil Co. 4 Phares, C W½ NE NE 32-20n-6w; dry, T.D. 3,786 ft.

Montcalm County: Winfield Township: Taggart Bros. Co. 19 Workings-Jack et al, C W¼ 6-12n-9w; 1,980,000 cu. ft. natural gas; T.D. 1,131 ft.

Oakland County, Springfield Township: Frank Summers and associates 1 Ellis, NE SW SE 14-4n-8e; wildcat test, dry; T.D. 4,887 ft., P.B. to 4,726 ft., swabbed 2 bbl. after nitro shot P.B. to 2,400 ft. for brine source.

Osceola County: Osceola Township: Taggart Bros. Co. 10 Stine, C NW 23-18n-8w; gas test, dry; T.D. 1,472 ft.

Taggart Bros. Co. 11 Niegarth-Rueffer, C NE Sec. 21; 274,000 cu. ft. gas; T.D. 1,511 ft.

Roscommon County, Roscommon Township: Pure Oil Co. 1-C State-Roscommon, C S½ SE NW 33-21n-3w; 2,304 bbl. natural; T.D. 3,417 ft.

Saginaw County, Chapin Township: Miller Bros. 1 Sutliff, SE SE SE 10-9n-1e; wildcat, dry, had oil show; T.D. 2,922 ft., P.B. to 2,505 ft.

Van Buren County, Bloomingdale Township: George L. Kernodle 1 Eastman, SW NE NE 12-1s-14w, pumping 10 bbl. and salt water, acidized; T.D. 1,270 ft.

In addition to the five permits to Taggart Brothers, the Conservation Department approved four other applications for oil tests in Bay, Ottawa, Clare, and Allegan counties, bringing the 1942 total to 217.

First Reports at Highest Level Since Start of M-68

MATTOON, Ill.—A record number of new Illinois operations for the 5-month period since federal drilling restrictions were imposed was reported last week and there were all the makings of a new oil boom throughout the basin area following the discovery of nine widely scattered pools in the past 6 weeks. Fifty-three first reports were announced for the week and most of the new operations were clustered in the areas recently proved productive by the wildcatters.

In Clay County four wells have been started near J. Hall Jones 1 Neely, NE NW NE 11-3n-7e, a McClosky discovery ½ mile east of the East Flora pool. No. 1 Neely flowed 500 bbl. in 24 hours natural after plug was drilled to the McClosky at 2,939-45 ft. and 2,947-52 ft. The well was then given a 5,000-gal. acid treatment and for a time flowed at the rate of 125 bbl. an hour. On latest tests, however, production had dropped back to 508 bbl. in 24 hours.

The new operations around the discovery are Wiser Oil 1 J. Suliens, SE SW 2-3n-7e, coring at 2,995 ft.; T. M. Pruitt 1 Cailtoux, SE NW 11-3n-7e, drilling below 2,100 ft.; L. & W. Drilling Co. 1 Stanford-Lee, NE NE 11-3n-7e, drilling below 1,200 ft.; and Walter Duncan 1 J. Partridge, SE SE 2-3n-7e, derrick up.

Another Clay County wildcat 3 miles northeast of Sailor Springs, National Petroleum Co. 1 Hinterscher, NW SE SE 10-4n-8e, is being put on pump after swabbing 10 bbl. of oil and 2 bbl. of water an hour. The well, a pool opener, was acidized with 2,900 gal. in the McClosky lime after casing was perforated. Perforations were made at 3,096-3,102 ft.

Jefferson County May Have New Oil Pool

An important discovery of the week was the Lewis Production Co. 1 State Game Farm, SW SW SE 21-3s-3e, Jefferson County. On a 1-hour drill-stem test in the Aux Vases approximately 600 ft. of oil rose in the hole. Total depth of the test is 2,762 ft.

The 1 State Game Farm is on a 240-acre tract of land recently leased by the Lewis Co. from the state for a reported $30,000 after a month of bidding. The location and operation of the test was supervised by the state and has caused wide comment throughout the tri-state area. Operators are highly interested in watching the pool's development.

In Franklin County, near Sesser, plug has been drilled at Ike Taylor 1 Old Ben Coal Co., NE NW NE 19-5s-1e, after casing was set to the Aux Vases on the strength of 1,300 ft. of oil in the hole on a 1-hour drill-stem test. Other information concerning the test has not been released but the state has announced that 17 permits have been issued to Taylor for offsets in the area, indicating that results of the first test have been highly satisfactory to the operators.

R. Bruce Martin et al 1 Leon Minor, SE NE NE 28-8s-9e, Gallatin County, was swabbing at the rate of 4 bbl. an hour natural from the Tar Springs late last week. Tar Springs saturation was encountered at 2,166-76 ft. No. 1 Minor is a wildcat test about 2 miles south of Martin 1 Bahl, a recently completed Cypress discovery.

A Trenton lime pool opened 14 miles northeast of Belleville in Madison County, M. D. Bryant 1 Hugo Meyer, W½ NE SE 16-3n-6e, pumped 107 bbl. of oil natural in 24 hours from pay at 2,344-53 ft. No. 1 Meyer is the first discovery of the year on the extreme western side of the basin.

ILLINOIS COMPLETIONS

Wildcats

Clay County: B. F. Williams et al 1 Thompson, N½ NW SE 30-3n-6e, pumped 25 bbl. oil and 20 bbl. water, 15-qt. shot 2,665-72 ft., T.D. 2,955 ft., P.B. 2,782 ft., *pool opener.*

Chris Pearson 1 Murvin, SW SW 15-5n-7e, dry at 2,925 ft., Glen Dean 2,344 ft., Barlow 2,484 ft., Cypress 2,556 ft., Paint Creek 2,669 ft., Benoist 2,682 ft., Renault 2,740 ft., Aux Vases 2,746 ft.

Cumberland County: Falcon-Seaboard et al 1 Nauman, N½ SW SW 16-9n-8e, dry at 2,698 ft., Glen Dean 2,157 ft., Golconda 2,208 ft., Barlow 2,290 ft., Paint Creek 2,452 ft., Benoist 2,477 ft., Renault 2,490 ft., Ste. Genevieve 2,547 ft., Fredonia 2,596 ft.

Edwards County: C. F. Steele 1 G. Tribe heirs, SE SW SW 25-1s-10e, location abandoned.

Wayne County: N. V. Duncan 1 Anderson-Rogers, NE NE 14-1s-6e, pumped 17 bbl. oil and 65 bbl. water, 1,000 gal. acid, reacidized 1,500 gal., McClosky 3,196-99 ft., 3,215-17 ft., T.D. 3,266 ft., P.B. 3,229 ft.

White County: Skelly 1 Stella Fearn, SE SE NE 19-3s-14w, pumped 12 bbl. oil and 30 bbl. water, 12-qt. shot 1,836-93 ft., McClosky 3,002-83 ft., Pennsylvanian pay 1,836-45 ft., T.D. 3,096 ft., P.B. 1,842 ft.

Fields

Akin, Franklin County: Seaboard 2 U. S. Coal & Coke, NW SE 14-6s-4e, pumped 69 bbl. oil and 99 bbl. water, 30-qt. shot 2,832-42 ft., Weller 2,832 ft., T.D. 2,842 ft.

Allendale, Wabash County: H. H. Stiles 2 Trimble, SE SE 35-2n-12w, pumped 30 bbl. oil and 10 bbl. water, 100-qt. shot 1,975-86 ft., Benoist 1,975 ft., T.D. 1,987 ft.

Bible Grove, Clay County: Texas 1 W. G. Landwehr, NW SE NE 8-5n-7e, pumped 38 bbl. oil and 25 bbl. water, 1,000 gal. acid, McClosky 2,817-22 ft., 2,826-30 ft., T.D. 2,830 ft.

Clay City, Clay County: J. P. Weshborn 1 A. J. Bagler, N½ SW SW 12-2n-7e, dry at 3,073 ft., Glen Dean 2,530 ft., Golconda 2,609 ft., Barlow 2,685 ft., Paint Creek 2,815 ft., Aux Vases 2,958 ft., Ste. Genevieve 3,023 ft., McClosky 3,059 ft.

Dale, Hamilton County: Texas 2 J. C. Hall, NW SE NE 18-6s-7e, flowed 332 bbl., Aux Vases 2,999 ft., saturated sand 3,006-11 ft., T.D. 3,054 ft.

Dundas, Jasper County: Pure 3 W. R. Cunningham, W½ NW SE 19-5n-10e, flowed 341 bbl., 5,000 gal. acid, McClosky 3,829-33 ft., 2,838-41 ft., T.D. 2,855 ft.

Johnsonville, Wayne County: Olsen 1 Ward, SE NW 36-1n-6e, dry at 3,290 ft., Glen Dean 2,592 ft., Cypress 2,777 ft., Aux Vases 3,077 ft., McClosky 3,194 ft.

Mill Shoals, Hamilton County: Magnolia 2 A. Fyie, NE SE 25-3s-7e, pumped 35 bbl., 40-qt. shot 3,221-39 ft., Aux Vases sand 3,216 ft., T.D. 3,239 ft.

Mill Shoals, White County: McBride 3 B. Gray, NW NE NW 31-3s-8e, pumped 41 bbl. oil and 2 bbl. water, 40-qt. shot 3,220-45 ft., Aux Vases 3,213 ft., T.D. 3,246 ft.

New Harmony, White County: Sun 2 E. R. Greathouse, SE SE 33-4s-14w, gas-input well, Benoist 2,676 ft., T.D. 2,722 ft.

Rural Hill, Hamilton County: Magnolia 1 Hamilton-McFarland, NE NW SE 24-6s-5e, pumped 72 bbl., 8-qt. shot 3,127-35 ft., Aux Vases sand 3,120 ft., T.D. 3,137 ft.

Shell 3-C F. Lockwood, NE NE NW 24-6s-5e, dry at 743 ft.

Sailor Springs, Clay County: W. C. McBride 1 Golsby-Wilson, SE SW SE 34-4n-7e, pumped 96 bbl. oil and 40 bbl. water, natural, Cypress 2,584-94 ft., T.D. 2,599 ft.

Ste. Marie, Jasper County: Simon-Lebon 1 Ochs Consol., NW NW 8-5n-14w, pumped 151 bbl., 6,000 gal. acid, McClosky 2,847-54 ft., T.D. 2,878 ft.

Siegel et al 1 Bolander, E½ NW NE 7-5n-14w, pumped 80 bbl. oil and 20 bbl. water, perf. 2,859-61 ft., 1,000 gal. acid, McClosky 2,857-64 ft., T.D. 2,883 ft.

Sims, Wayne County: Bell Bros. 2 A. Fuhrer, E½ SW SW 28-1s-6e, swabbed 175 bbl., 40-qt. shot 3,012-32 ft., Aux Vases 3,009 ft., T.D. 3,038 ft.

Storms, White County: Shaffer & Stole 1 Aud, SE NW SE 27-6s-9e, pumped 13 bbl., 9-qt. shot 2,667-71 ft., 22-qt. shot 2,663-68 ft., Cypress 2,654 ft., pay 2,661-71 ft., T.D. 2,671 ft.

(Continued on Page 91)

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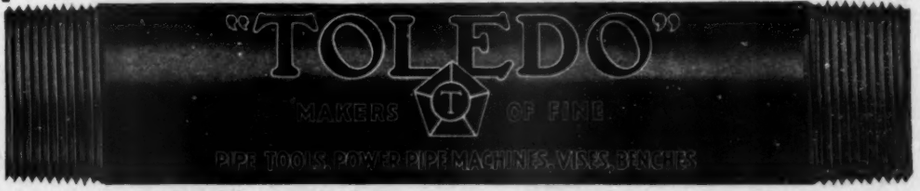

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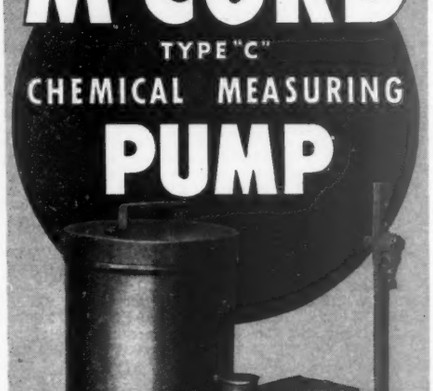

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Pilot Butte to Be Developed; North Dakota Block Leased

By T. R. INGRAM

DENVER, Colo.—The Rocky Mountain district moves into the summer season with increased leasing and wildcatting. Superior Oil Co. of California is preparing for a step-out from its recent Tensleep deep discovery in the old, shallow Pilot Butte oil field, Wyoming. Amerada has taken shooting option on a huge spread of acreage in North Dakota. General Petroleum is unitizing its Horse Creek block, near Cheyenne, preparatory to starting another Wyoming wildcat this year.

The Superior Oil Co. of California is grading location for 1 Tribal, SE NE NE 21-3n-1w, Fremont County, Wyoming. Test is ⅝ mile southwest of company's joint well with British American Oil Producing Co. 1 Tribal, which pumped 750 bbl. daily of 24.7° crude from the Tensleep sand through perforations between 6,184-6,325 ft. in the 7-in. at 6,446 ft. It is interesting to note that this deep-zone discovery is the first well to drill through the Tensleep, set pipe, and complete through perforations. Practice, heretofore, in completing in the Tensleep has been to set pipe on top of the sand. Operators will complete by the older practice in the present or subsequent tests to the Tensleep at Pilot to determine what effect the different completion methods may have upon production rates.

British American is expected to make location for a test on its acreage, and which will probably be an extension try to the northeast on the deep zone. Superior and British hold about 1,000 acres each, and 5,000 acres jointly on the Pilot structure.

North Dakota Leasing

Option for geophysical work toward possible leasing for wildcatting on four blocks of acreage totaling 168,000 acres has been taken in North Dakota by Amerada Petroleum Corp. from Thomas W. Leach of Bismarck. Optioned are the Max block, McLean County, 40,000 acres in Townships 148, 149, and 150n, Ranges 82 and 83w; Lefor block, Stark County, 52,000 acres in Townships 137 and 138n, Ranges 94, 95, and 96w; Shepperd Butte block, Hettinger County, 36,000 acres in Townships 135 and 136n, Ranges 91, 92, and 93w; and the Teepee block, also in Hettinger County. Townships 133 and 134n, Ranges 96 and 97w.

General Petroleum Corp. is unitizing its 6,500-acre block of land, largely federal with some state and fee, covering the Horse Creek structure, 35 miles northwest of Cheyenne, Laramie County, Wyoming. The Colorado & Southern Railroad runs across the Horse Creek structure. General Petroleum plans drilling of the test in about 40 days on completion of its 34-15-P, drilling at 500 ft., Wheatland anticline, Platte County, from which it will move rotary for the Horse Creek test.

Big West Oil Co. extended the West Kevin gas field ½ mile northwest pointing toward possible joining of the Kevin-Sunburst and Cut Bank field gas areas. No. 1 Vial, SW SW 31-35n-4w, 10 miles west of the town of Kevin, Mont., gaged 7,602,000 cu. ft. daily in the Cut Bank sand from 2,150-65 ft. after plugging back from 2,310-15 ft., Ellis-Madison contact where the well failed to yield after slight show of oil was treated with 500 gal. of acid.

WYOMING COMPLETION

Lance Creek field, Niobrara County: Continental (for Buck Creek Oil Co. account) 1 Rodeo-4, SW SW SW 27-36n-65w, dry in basal Sundance, made into gas-input well for pressure-maintenance system, T.D. 4,129 ft.

MONTANA COMPLETION

Cut Bank field, Glacier County: Santa Rita 1 Hendrickson, E½ E½ NW 10-34n-5w, gaged 6,200,000 cu. ft., 625 lb. pressure, Cut Bank sand, T.D. 2,608 ft.

Eastern Texas Fields

(Continued from Page 87)

in the Wanhop Survey, was moving in rig on a south offset location from the discovery.

EAST TEXAS COMPLETIONS

Wildcats

Harrison County: W. F. Saye 1 Blocker estate, M. S. Ussery Sur., dry, T.D. 3,580 ft.

Limestone County: Texas 1 W. A. Keeling et al 1, A. Whitaker Sur., 6 mi. SW of Cooledge, dry, T.D. 6,018 ft.

Upshur County: R. W. Burnett 1 J. E. Reynolds, Ira Stephenson Sur., 5 mi. NE of Big Sandy, dry, salt water, sand 3,838-79 ft., T.D. 3,932 ft.

Wood County: J. Papadakis 1 S. L. Old, J. R. Smith Sur., dry, T.D. 6,211 ft.

A. R. Klemm 1 O. E. Bellamy, W. T. Marshall Sur., 1 mi. W of Golden, dry, T.D. 4,610 ft.

Fields

Concord, Anderson County: Magnolia 1 J. Kelley, J. B. McNeely Sur., dry, salt water, T.D. 4,788 ft.

Hawkins, Wood County: Humble 5 J. P. Crisman, J. Pollock Sur., potential 171.87 bbl. in 18 hr. through ¼-in. choke, T.D. 4,862 ft.

Humble 3-B J. T. Green, H. E. Watson Sur., potential 113.58 bbl. in 6 hr. through ¼-in. choke, perf. 4,610-13 ft. and 4,616-22 ft., T.D. 4,747 ft.

Humble 2-B E. W. Moore, J. Pollock Sur., potential 261.39 bbl. in 24 hr. through ¼-in. choke, T.D. 4,600 ft.

Humble 3-A F. B. Ponder, J. Pollock Sur., potential 106.21 bbl. in 6 hr. through ¼-in. choke, T.D. 4,891 ft.

Longview area, East Texas field, Gregg County: T. E. Phillips et al 1 William Dunbar, James Price Sur., dry, salt water with show oil, Pecan Gap 2,520-3,030 ft., Austin chalk 3,595-3,645 ft., sand 3,650 ft.

Powell, Navarro County: Stroube & Stroube 1 I. T. Cerf, potential 500 bbl. fluid, 25 bbl. oil and 15,000 cu. ft. gas, perf. 2,898-2,901 ft. and 3,140-45½ ft., T.D. 3,164 ft., P.B. 2,901 ft.

Louisiana Gulf Coast

(Continued from Page 82)

although very little information has been released.

LOUISIANA GULF COAST COMPLETIONS

Fields

Barataria, Jefferson Parish: California 1 Unit 110, dry T. D. 10,835 ft.

Bayou Des Allemands, St. Charles Parish: Stanolind 1 St. Charles Land Co., perf. casing 9,685-92 ft., T.D. 10,267 ft.

Bayou Sale, St. Mary Parish: Humble 4 E. F. Marin, dry, T.D. 11,475 ft.

Delta Duck Club, Plaquemines Parish: Texas 2 Delta Duck Club, dry, T.D. 11,150 ft.

Lake Chicot, St. Martin Parish: Amerada 3 State, 259 bbl., ⅛-in. choke, perf. casing 8,170-80 ft., T.D. 11,063 ft.

Quarantine Bay, Plaquemines Parish: Gulf 37 State, 294 bbl., 9/64-in. choke, perf. casing 8,618-28 ft., T.D. 8,630 ft.

Starks, Calcasieu Parish: W. T. Burton 5 Lutcher Moore, 157 bbl., ¼-in. choke, perf. casing 5,344-57 ft., T.D. 5,519 ft.

Stella, Plaquemines Parish: California 1 Unit 180, dry, T.D. 9,000 ft.

Venice, Plaquemines Parish: Tide Water 15 Buras Levee Board, 235 bbl., ⅛-in. choke, perf. casing 10,293-10,305 ft., T.D. 10,353 ft.

Ville Platte, Evangeline Parish: Continental 1 J. E. Vidrine, 221 bbl., 10/64-in. choke, perf. casing 10,152-70 ft., T.D. 10,190 ft.

West Gueydan, Vermilion Parish: Pure 2 Vermilion Irrigation Co., 239 bbl., ¼-in. choke, perf. casing 10,783-92 ft., T.D. 11,000 ft.

White Castle, Iberville Parish: Shell 25 Wilbert, 159 bbl., 8/64-in. choke, perf. casing 5,890-98 ft., T.D. 5,945 ft.

Lamotte Sand Produces in Kruckenberg Outpost

By CARL HOOT

HIGHLIGHTS of the week's developments in Kansas were discovery of a new pay sand in southwestern Barton County and a 1-mile-south extension to the Lindsborg pool of McPherson County.

Helmerich & Payne 1 Merten, NW NW NE 10-19-15w, Barton County wildcat on the southeast flank of the Albert-Otis structure, was estimated at 100 bbl. a day after 2,000 ft. of oil rose in the hole from LaMotte sand topped at 3,551 ft. Total depth is 3,578 ft. Swabbing tests produced 5 bbl. an hour. Location is a half mile west of the small Kruckenberg two-well pool which produces some 5 or 6 bbl. a day from Lansing and Arbuckle lime at approximately the same depth as the new Lamotte sand well

In McPherson County, 1 mile south of the Lindsborg pool, Dickey Oil Co. et al 1 Rundberg, W½ NW NE 19-17-3w, filled 700 ft. with oil in 7 hours from Viola lime topped at 3,359 ft. Total depth is 3,363 ft.

Second Well for Zook Pool

In southern Pawnee County, Stanolind Oil & Gas Co. added another Arbuckle producer to its one-well Zook pool with the completion of 1 Gilkison, SW cor. 15-23-16w. The well flowed an estimated 192 bbl. of oil and the same amount of water from Arbuckle topped at 4,144 ft. Location is a southeast offset to the discovery, 1 Smith, which flowed 122 bbl. of fluid cutting 25 per cent in 26 hours from Arbuckle at 4,066 ft.

Extension for Smyres

The Smyres pool of eastern Rice County, designated as 36-19s-6w, but having its four producing wells spread out in a straight line north and south through the center of the section and extending ¼ mile into Section 25, was broadened at the base, or southern end by W. C. McBride 1 Hill, NE SW SE 36-19-6w. Initial production of 490 bbl. was from Mississippi lime at 3,397 ft., some 30 ft. lower than average for the field.

In northwestern Kansas, the Ray pool of Phillips and Norton counties had a failure in the Barnett Drlg. Co. 1 Nichol, NE NW NE 6-6-20w, across the line into Rooks County on the south. Neither the Lamotte nor Arbuckle zone was found in drilling to 3,555 ft., total depth. Drilling activity has picked up considerably in the field, which had production extended into Norton County last week.

Northeast Peace Creek

Cities Service Oil Co. 1-C Hinshaw, SW SE NW 11-23-10w, a north outpost from the Northeast Peace Creek field, found the Viola dry at 3,789 ft. and was abandoned at total depth of 3,800 ft. It is the first failure in the immediate area and is about half way along the 7½-mile Viola lime trend extending northeast from Southwest Peace Creek to the Schweizer pool. Transwestern Oil Co. 1 Ramsey, SE SW SW 36-22-10w, flowed by heads at the rate of 70 bbl. an hour, extending the Hendrickson pool on the northeast and narrowing the gap between Hendrickson and Schweizer.

KANSAS COMPLETIONS

Wildcats

Pawnee County: Adair & Morton et al 1 Thompson. NW NE NW 16-22-20w, dry, T.D. 5,012 ft., Wreford 2,640 ft., Neva 2,835 ft., Topeka 3,500 ft., Lansing 3,840 ft., conglomerate 4,346 ft., Mississippi lime 4,424 ft., Viola 4,585 ft., Simpson 4,953 ft., Arbuckle 4,960 ft.

Saline County: E. B. Shawver 1 Agin, NW NE 33-15-1w, dry, T.D. 2,655 ft., Lansing 1,963 ft., Mississippi lime 2,608 ft.

Fields

Batesville, Woodson County: O. J. Connell 1-A Fulhage, SW SW SE 27-25-14, dry, T.D. 1,506 ft.

Blankenship, Butler County: Henry Bennett et al 14-A Drumm-Bitler, SW NW SE 20-26-8, pumped 35 bbl., Bartlesville 2,710-50 ft., T.D. 2,751 ft.

Campbell, Rice County: Lauck & Moncrief 1-A Purcell, N½ N½ NE 28-19-9w, dry, T.D. 3,294 ft.

Cunningham, Pratt County: Cities Service 1 Bucklin, E½ NW NE 10-28-11w, abandoned location.

Forest Hills, Russell County: Cities Service 1 Anschutz, NE SW 20-15-12w, dry, T.D. 3,372 ft.

Frog Hollow, Cowley County: Sinclair Prairie 3-A Gardner, NW NE SE 16-32-5, pumped and flowed 494 bbl., Bartlesville sand 3,083-94 ft.

Gorham, Russell County: Stanolind 1-A Baier, E½ NE SE 35-13-15w, 1,752 bbl., swabbed 22 bbl. an hr., Arbuckle 3,303-17 ft.

Greenvale, Russell County: Phil-Han Oil 3 Soukup, SE NW SW 3-15-12w, 2,922 bbl. potential, Lansing 2,965-3,023 ft.

Hendrickson, Reno County: Transwestern Oil 1 Ramsey, SE SW SW 36-22-10w, flowed by heads, 70 bbl. in 1 hr., potential 3,000 bbl., Viola 3,698-3,702 ft.

Peace Creek, Northeast, Reno County: Cities Service 1-C Hinshaw, SW SE NW 11-23-10w, dry, T.D. 3,008 ft., Lansing 3,270 ft., Viola 3,789 ft.

Lion Oil Ref. 1 Wiederoder, SW NW SW 12-23-10w, flowed 35 bbl. an hr. for 8 hr., Viola 3,753-63 ft.

Rahn, Cowley County: Claude Myers et al 1 Rahn, NW SW NE 13-34-5, dry, T.D. 2,970 ft.

Ray, Phillips County: Cities Service 1 Walgren, SW NW SE 29-5-20w, 1,861 bbl. potential, La Motte sand 3,624-34 ft.

Cities Service 3-B Hansen, SW NE NW 33-5-20w, 1,735 bbl., potential, La Motte sand 3,534-51 ft.

Ray, Rooks County: Barnett Drlg. 1 Nichol, NE NW NE 6-6-20w, dry, T.D. 3,555 ft., no Arbuckle or La Motte.

Raymond, Rice County: Colorado Pet. 2 Thompson, E½ E½ SW 17-20-10w, dry, T.D. 3,151 ft.

Ritz, McPherson County: H. M. Hauser 1-A Hill, NE SE 23-19-2w, dry, T.D. 2,964 ft.

H. M. Hauser 2 Hill, SE SE 23-19-2w, abandoned location.

Smyers, Rice County: W. C. McBride 1 Hill, NE SW SE 36-19-6w, pumped 490 bbl., Mississippi lime 3,397-3,400 ft.

Trapp, Russell County: N. Appleman 2 Anschutz, NE SW NW 10-15-13w, 3,000 bbl., Lansing 3,055-81 ft.

Zook, Pawnee County: Stanolind 1 Gilkison, SW cor. 15-23-16w, flowed 192 bbl., Arbuckle 4,144-45 ft.

NEBRASKA

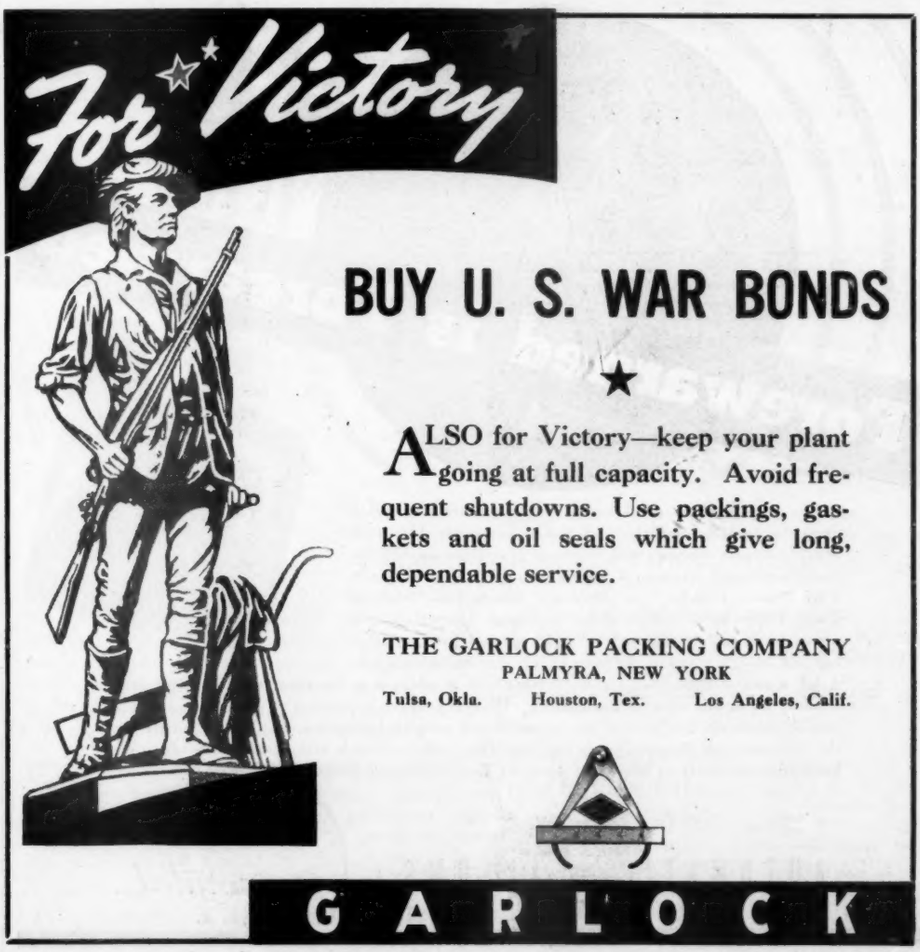
ST. JOSEPH, Mo.—Skelly Oil Co., as the week closed, was examining a cement job preparatory to testing Hunton lime in its 1 Wiltse in the Dawson pool of Richardson County, a hole that had looked favorable for Viola production. In E½ NW SE 10-1n-14e, the test was given two chances to produce in Viola lime. Both failed after acidization. Wilcox sand and Simpson lime likewise failed. The company now is starting a new well, 1 Buser estate, about a mile north in SE 3-1n-14e.

Illinois Fields

(Continued from Page 89)

Stringtown, Richland County: Helmerich & Payne 2 Sterchi, S½ SE SW 31-5n-14w, pumped 65 bbl., 3,000 gal. acid, McClosky 3,026-29 ft., T.D. 3,081 ft.

Walpole, Hamilton County: Texas 3 R. Hall, W½ SW NW 27-6s-6e, pumped 94 bbl. oil and 4 bbl. water, natural, Tar Springs sand 2,464 ft., T.D. 3,127 ft., P.B. 2,472 ft.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Posey County Wildcat Shows Oil in Upper McClosky Lime

EVANSVILLE, Ind.—Gulf Refining Co. 1 Starack, NE NE 30-6s-13w, a wildcat west of Farmersville in Posey County, had a showing of oil in the McClosky lime at 2,807-10 ft. last week. The show was not tested, however, as operators drilled ahead in search of a second McClosky break. The Aux Vases, topped at 2,775 ft., was dry.

Jarvis Bros. et al 1 Sanders, SE NW 26-6s-13w, in the Bufkin field, is waiting on cement after saturation in McClosky lime was cored at 2,733-41 ft. The test is southwest of Rossi 1 Sanders and west of Pledger 1 Utley, both dry holes. Following a drill-stem test of the McClosky at 1 Sanders, it was estimated that the well may make as much as 30 bbl. an hour. Plug will probably be drilled within the next few days.

A south outpost to the new East Mount Vernon field, Smokey Oil Co. 1 J. A. McCarthy, NW SW 17-7s-12w, Posey County, is drilling ahead after finding the Aux Vases dry. The Aux Vases is the producing formation in the field to the north.

OHIO

ZANESVILLE, Ohio.—In southeastern Ohio, the Clayton pool in Perry County yielded three fair oil wells and one recompletion for a total initial production of 451 bbl. This pool is now operating under a blanket exception to M-68. Gas completions were scattered and small.

OHIO COMPLETIONS

Ashland County, Vermillion Township: Ohio Fuel 1 R. M. Wilson, Sec. 19, 740,000 cu. ft. gas, Clinton, T.D. 2,730 ft.

Jackson Township: Konrad & Son 1 L. Franks, Sec. 22, 8 bbl., shot, Berea, T.D. 702 ft.

Licking County, Eden Township: National Drlg. Co. 1 W. Nethers, Sec. 18, 140,000 cu. ft. gas, shot, Clinton, T.D. 2,700 ft.

Mary Ann Township: Ohio Fuel 3 John Maharg, Sec. 6, 600,000 cu. ft. gas, Clinton 2,625-58 ft., T.D. 2,661 ft.

Meigs County, Salisbury Township: Ohio Fuel 2 Jessie Russell, Sec. 31, shot, 40,000 cu. ft. gas, second Berea, T.D. 1,550 ft.

Morgan County: York Township: Litton & Radford 2 F. Matheney, Sec. 22, 400,000 cu. ft. gas, shot, Clinton 4,198-4,243 ft., T.D. 4,268 ft.

Industrial Gas Co. 2 C. A. Eppley, Sec. 27, dry, Clinton 4,248-89 ft., T.D. 4,361 ft.

Muskingum County, Newton Township: Industrial Gas Corp. 1 Jenkins & Elliott, SE Sec. 7, dry, through Clinton and Medina, T.D. 3,470 ft.

Noble County, Jefferson Township: Andrew K. Cline 20 George Hupp, SW Sec. 10, 2 bbl., Berea after shot, T.D. 1,830 ft.

Perry County, Clayton Township: Pure Oil 4 Bert Williams, Sec. 7, 136 bbl., shot, Clinton 3,188-3,231 ft., T.D. 3,248 ft.

Preston Oil 7 J. H. Cookson, Sec. 8, flowed 159 bbl., shot, Clinton 3,236-75 ft., T.D. 3,281 ft.

Preston Oil 2 Corynne Wagner, Sec. 8, flowed 150 bbl., shot, Clinton 3,304-57 ft., T.D. 3,365 ft.

Preston Oil 1 J. W. Ford, Sec. 6, 6 bbl., shot, Clinton, gas well, deepened from 3,196 ft., sand 3,172-3,212 ft., T.D. 3,230 ft.

Tuscarawas County, Lawrence Township: Natural Gas Co. of W. Va. 1 J. J. Lebold, first quarter, dry, Clinton, T.D. 4,614 ft.

Washington County, Barlow Township: H. W. Baker 1 H. Woodburn, Sec. 10, 450,000 cu. ft. gas, stray, T.D. 1,005 ft.

Liberty Township: Graham Oil 1 Charles Schenkel, Sec. 4, 70,000 cu. ft. gas, Maxon and Injun, T.D. 1,646 ft.

Liberty O. & G. Co. 12 John Remenschneider, Sec. 7, 2 bbl., shot, Injun, T.D. 1,742 ft.

Wesley Township: T. B. Russell 9 Alexander Martin Lot 1101, 4 bbl., Peaker sand, T.D. 480 ft.

EASTERN KENTUCKY

ASHLAND, Ky.—Drilling operations showed a slight upturn in this part of the state this week with a few new locations reported in some areas.

Two gas wells were reported completed with a combined daily open flow of 664,000 cu. ft. of gas.

Reports from some areas indicate resumed operations after shutdowns for lack of water or mechanical reasons.

Pike County: Kentucky-West Virginia Gas Co. 692 J. M. Taylor, 545,000 cu. ft. gas at 1,065 ft. in Salt sand.

Floyd County: 5316 H. B. Akers, old well drilled deeper, has an open flow of 119,000 cu. ft. of gas, shot, at 2,290 ft. in shale.

Several other wells in this area are at completion depth or awaiting shot, and in one instance gas is being tested.

A report from Lawrence County says Ed Obermiller was due to drill in No. 1 on the R. Blankenship land but completion data were not given.

Appalachian Fields

(Continued from Page 85)

WEST VIRGINIA COMPLETIONS

Calhoun County, Sheridan district: Francis E. Pettit 1 Roy Cain et al, dry, Salt sand 1,238-1,350 ft., Maxton 1,702-1,838 ft., Little lime 1,838-50 ft., Nencil Cave 1,855-57 ft., Big lime 1,857-1,915 ft., Injun sand 1,930-46 ft., T.D. 2,008 ft.

Clay County, Henry district: Virginian Gasoline & Oil Co. V-1317 Brown, Swann & Goshorn, 3 bbl., Injun sand, T.D. 1,845 ft.

Marshall County, Liberty district: Manufacturers Light & Heat Co. 3652 I. D. Franklin, 193,250 cu. ft. gas, Salt sand, T.D. 1,591 ft.

Putnam County, Curry district: Hunters Gas Co. 2 J. A. Johnson, gas well, no gage, Big lime 1.545 ft., Injun 1,745-95 ft., Berea 2,247-74 ft., shot 2,247-74 ft., T.D. 2,274 ft.

Ritchie County, Grant district: Leavitt & Black 2 G. C. Jones, 5 bbl., Horseneck sand, seems to be exhausting, if so, will deepen, T.D. 280 ft.

Tyler County, Centerville district: American Oil Development Co. 1 Leroy Pierpoint, dry, dropped casing and could not fish, moving to new location, T.D. 1,820 ft.

ORISKANY GAS FIELDS

Jackson County, Ripley district: Godfrey L. Cabot, Inc., 13 J. L. McLean heirs, 251,000 cu. ft. gas, Corniferous lime 5,073 ft., Oriskany 5,190 ft., shot 5,194-5,227 ft., R.P. 1,005 lb., 45 hr., T.D. 5,268 ft.

Washington district: Columbian Carbon Co. 1 F. M. Winters, dry, Salt sand 1,600-1,770 ft., Big lime 1,794-1,894 ft., Injun 1,894-2,010 ft., Berea 2,392-2,406 ft., Corniferous lime 5,019-5,139 ft., Oriskany 5,139-86 ft., sand 5,198-5,214 ft., ½ bailer water 5,166 ft., T.D. 5,233 ft., may produce shale gas.

Kanawha County, Poca district: Columbian Carbon Co. 1 Lora Jackson, 1,929,000 cu. ft. gas, Corniferous lime 5,023 ft., Oriskany 5,155 ft., shot 5,161-91 ft., R.P. 790 lb. 16 hr., T.D. 5,229 ft.

South Penn Natural Gas Co. 2 Marion Bostick, 1,996,000 cu. ft. gas, Big lime 1,625 ft., gas 1,655-61 ft., T.D. 1,663 ft.

Rex Oil & Gas Co. 3 J. A. Haynes heirs, dry, Salt sand, T.D. 1,440 ft.

Southwest Texas

(Continued from Page 86)

choke, open flow, perf. casing 6,612-17 ft., T.D. 7,000 ft.

East Placedo, Victoria County: Stanolind 16 Vandenberg, 117 bbl., 7/64-in. choke, perf. casing 6,870-73 ft., T.D. 6,874 ft.

Superior 3 Brandi, 138 bbl., ⅛-in. choke, perf. casing 6,867-69 ft., T.D. 6,920 ft.

Midway, San Patricio County: British American 1 Boykin, dry, T.D. 6,126 ft.

Odem, San Patricio County: Seaboard 6 Smith, 91 bbl., ⅛-in. choke, perf. casing 5,323-25 ft., T.D. 5,570 ft.

Richard King, Nueces County: Southern Minerals 27 King, 87 bbl., ⅛-in. choke, perf. casing 5,354-64 ft., T.D. 5,599 ft.

Stratton, Kleberg County: Humble 12 King, 119 bbl., ⅛-in choke, perf. casing 6,478-85 ft., T.D. 6,688 ft.

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Stratton, Nueces County: Southern Minerals 40 Stratton, 89 bbl., 7/64-in. choke, perf. casing 6,616-26 ft., T.D. 6,655 ft.
Southern Minerals 38 Stratton, 81 bbl., 7/64-in. choke, perf. casing 6,521-37 ft., T.D. 6,640 ft.
Mid-Continent 2 Martindale, 115 bbl., ⅛-in. choke, perf. casing 6,576-82 ft., T.D. 6,714 ft.
West Tuleta, Bee County: Dirks Brothers 1 Mayfield, dry, T.D. 8,013 ft.

LAREDO DISTRICT

Wildcats

La Salle County: Quintana 1 Kostroun, dry, T.D. 5,362 ft.
McMullen County: Magnolia 1 J. E. Murphy, dry, T.D. 2,748 ft.
Starr County: Cottonwood 1 Salinas, dry, T.D. 2,208 ft.
Webb County: Boller & Rutledge 1, dry, T.D. 4,545 ft. Holland 1 Neal, dry, T.D. 2,020 ft.

Fields

Colorado, Jim Hogg County: Humble 68-B King, 130 bbl., ⅛-in. choke, T.D. 3,119 ft.
Humble 66-B King, 14 bbl., ⅛-in. choke, T.D. 3,141 ft.
Nichols, Hidalgo County: Phillips 1 Improvement, dry, T.D. 4,512 ft.
Sun, Starr County: Humble 12 Montalvo, dry, T.D. 4,644 ft.
Sun 4 Garza, dry, T.D. 4,503 ft.

SOUTH CENTRAL TEXAS

Wildcats

Bastrop County: Ogden & Riddle 3-B Riddle, dry, T.D. 1,937 ft.

West Central Texas

(Continued from Page 88)

FORT WORTH, Tex.—The Sandy Ridge pool, Jones County, was extended a short distance by Algord Oil Co. 1 J. T. Badgett, which made 40 bbl. natural from the Bluff Creek sand at 1,937 ft. The well is located SW SW SE Section 5, Block 15, T.&P. Survey.

In the same county, Ungren & Frazier 1 E. Hayes in Section 243, Henry Millars Survey, was abandoned at 2,008 ft. The test was 2 miles south of Hawly.

Throckmorton County is getting a deep play with two tests spudded and a third located. The location is Amerada 1 Annie Williams, William Cassell Survey, 4 miles north of Elbert which will go to 5,500 ft. in search of Ellenburger production. The other tests are British American 1 McCluskey, a 5,000-ft. test 4½ miles north of Throckmorton and Humble 1 J. O. Crump, Section 956, T.E.&L. Survey, which is below 1,100 ft.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Callahan County: Rhodes Drilling 1 R. H. Seale, Lewis Johnson Sur. 252, dry, T.D. 1,165 ft.
Jones County: Fain-McGaha and Sinclair Prairie 1 P. Carlson, Sec. 189, B.B.B.&C. Sur., dry, T.D. 3,330 ft.
Humble 1 Anna E. Cook et al, Sec. 46, Blk. 18, T.&P. Sur., dry, T.D. 4,335 ft.
Shackelford County: Kittery Oil et al 1 J. H. Elliott, Sec. 9, L.A.L. Sur., flowed 1½ bbl. oil with 640,000 cu. ft. gas after acid, gravity 38.8, lime 2,627-92 ft. and sandy lime 2,692-2,703 ft., T.D. 2,911 ft., P.B. 2,703 ft., *discovery*.

Fields

Brownwood, Brown County: Hightower Oil & Refining 1-C Buckner's Orphan Home, William Iron Sur., 3,000,000 cu. ft. gas with spray oil after acid, lime 1,433-88 ft., T.D. 1,498 ft.
Cook, Shackelford County: Roeser-Pendleton and Continental 12-A-117, W. I. Cook estate, Sec. 117, E.T. Sur., pumped 119 bbl. natural, sand 1,706-15 ft., T.D. 1,715 ft.
Jim Ned, Coleman County: Lewis Production 1 C. G. Bush, Lot 22, St. Augustine University Sur. 519, dry, T.D. 4,270 ft.

Permian Basin, Panhandle

(Continued fro Page 81)

Wasson Deep, Gaines County: Carter and Continental 5-A Willard, 660 ft. from E line and 1,980 ft. from S line of lease, Sec. 39, Blk. AX, P.S.L. Sur., elev. 3,535 ft., flowed 497 bbl. through ½-in. tubing choke after acid, pay 4,860 ft., T.D. 5,020 ft.
Amon G. Carter 6 Sharp, elev. 3,540 ft., flowed 817 bbl. through ¾-in. tubing choke after acid, pay 4,872 ft., T.D. 4,975 ft.
Wasson, Yoakum County: American Liberty 10 Moore, elev. 3,633 ft., flowed 354 bbl. oil plus 4 per cent water through tubing on gas lift after acid, pay 5,125 ft., T.D. 5,183 ft.

New Pool Opened Southwest of Shugart

ARTESIA, N. M.—Culbertson & Irwin have opened a new pool 2½ miles southwest of the Shugart area south of Maljamar. No. 1 Vandagriff, SW NE 6-19-31, found the pay in sand at 3,326-43 ft. and filled 200 ft. with oil in 10 hours. At last reports, it was drilling at 3,447 ft. with 1,700 ft. of oil in the hole. There is little gas but there may be enough to flow the well after it is cleaned out. A test is being started 2½ miles southwest of the Vandagriff well by Culbertson & Irwin in SW SE 11-19-30.

This section of New Mexico is one of the few "independent" districts yet remaining. First production was near Artesia and in 1927 the Maljamar Oil & Gas Co. stepped out 25 miles to the east and brought in the Maljamar field. The wells in this field were not large but have held up persistently. Later the area between Maljamar and Artesia was drilled up as the Skelly, Grayburg-Jackson and later the Loco Hills fields. In 1937 there were a few wells to the north and south of the main trend, the most promising of which was the Shugart discovery.

Another parallel trend 12 miles to the south was also established by the Getty field and the Lynch, North Lynch and Halfway fields to the east. In an endeavor to find production between these trends, Culbertson & Irwin brought in the East Lusk pool with producers in 21 and 28-19s-32w. The gaps between producing areas are thus being slowly filled in and the establishment of new parallel trends can be expected to result in much additional development. The area is tributary to two refineries in Artesia and is traversed by the Texas-Empire pipe line.

Wildcat Project in East Central New Mexico

Plans for a new wildcat test for western Roosevelt County are under way. W. J. Peterman, oil man, was reported assembling a block for drilling, with probable location in 21-2s-30e, some 3 miles east of the town of Claudell.

SOUTHEAST NEW MEXICO COMPLETIONS

Maljamar, Lea County: Maljamar Oil & Gas 9-B Mitchell, NE SE 19-17-32, flowed 120 bbl. through open tubing natural, pay 3,578 ft., T.D. 3,725 ft.
Penrose, Lea County: Parker Drlg. 2 Long, NW SW SW 11-22-37, dry, T.D. 3,697 ft., produced 90 bbl. of oil before declining to less than ½ bbl. a day.

Amarillo Company Starts Second Sherman County Tests

AMARILLO, Tex.—Hagy, Harrington & Marsh have started their second gas test in Sherman County. It is in Section 21, Block 3-B, G.H.&H. Survey, and on the Coldwater ranch. The well is 5 miles north and 2 miles east of their former test in Section 44 which went into water at 3,380 ft. The new well, 1 Coldwater, is ½ mile south of 1 Bivins, drilled in 1926 by Get Oil Co., which got 13,000,000 cu. ft. of gas.

In Cimarron County, Oklahoma, Placid Oil Co. 1 State, NW SE 27-6n-5e, has been located and three gas wells have been completed in Texas County, Oklahoma. These are:

Cities Service 1 Burge, 20-6n-16e, 18,900,000 cu. ft. of gas after acid at 2,745-2,863 ft., with a pressure of 416 lb.
Republic Nat. Gas 2 McGrath, 10-3n-15e, 4,300,000 cu. ft. of gas, natural, 2,540-2,678 ft., R.P. 433 lb., T.D. 2,689 ft.
Republic Nat. Gas 1 Wilson, 22-6n-16e, 23,600,000 cu. ft. of gas, natural, 2,735-2,814 ft., R.P. 419 lb.,

TEXAS PANHANDLE COMPLETIONS

Gray County: Phillips 10 Pan-Baer-B, Sec. 125, Blk. 3, I.&G.N. Sur., 75 bbl. oil and 6 bbl. water, T.D. 3,297 ft.
Hutchinson County: Continental 3 Sanford-D, Sec. 77, Blk. 46, H.&T.C. Sur., 171 bbl., T.D. 2,828 ft.

Cockburn Lays Line From Square Lake

Barney Cockburn, Eddy County, New Mexico, operator, who recently sold his Maljamar pool production for a reported $1,500,000, is building a 6-in. pipe line from the North Square Lake area in Eddy County to the Johnson & Lodewick refinery at Roswell, N. M., a distance of 30 miles.

NORTH LOUISIANA, ARKANSAS

Start Smackover Lime Tests Far From Present Production

SHREVEPORT, La.—Two completions were reported in Arkansas last week, where work has been slow for several weeks. Barnsdall 1 Community-Powell, SE NW 10-15-24w, found the Smackover at 6,396 ft. and flowed 175 bbl. through tubing choke in 5 hours. It is the fifteenth producer in the Midway field. Barnsdall's 2 Powell, a west offset, was a location. The other completion was a small pumper from shallow sand in the Hillsboro field of Union County.

Three miles south of Smackover and approximately the same distance west of Lisbon, Lion Oil Refining Co. of El Dorado has spudded its 1 Lecroy, 36-16-17. The well is the first to be projected to the Smackover lime below 6,000 ft. and has attracted considerable interest. J. G. Strahan is preparing to drill a rank wildcat test in Little River County. It is the 1 Sykes, SW NW NE 36-11-31w, some 45 miles northwest of the Midway field. Little River County borders Oklahoma on the west and Texas on the south.

ARKANSAS COMPLETIONS

Hillsboro, Union County: W. M. Dalton 1-B Union Sawmill, SE NE 14-18-14w, pumped 17 bbl. oil and 20 bbl. water, sand 2,239-59 ft.
Midway, Lafayette County: Barnsdall 1 Community-Powell, SE NW 10-15-24w, flowed 175 bbl. in 5 hr. through choke, Smackover 6,396 ft., T.D 6,475 ft.

First Reports

Midway, Lafayette County: Barnsdall 2 Community-Powell, SW NW 10-15-24w, location.
Wildcat, Little River County: J. G. Strahan 1 Sykes, SW NW NE 36-11-31w, location.

Drilling activity in the Haynesville area of Claiborne Parish continues at a brisk pace with 22 rigs running to the deep pay. It looks as if the field could be considerably extended, possibly across the Arkansas State line.

NORTH LOUISIANA COMPLETIONS

Wildcats

Catahoula Parish: H. A. Harper et al 1 Graham Stave Lmbr. Co., NE SW 8-8-7, dry, T.D. 6,001 ft., Wilcox 3,243 ft., Midway 5,898 ft.
Concordia Parish The California Co. 1 Lake Concordia, SE cor. 36-8-9, dry, T.D. 6,725 ft., show oil and gas 4,480-4,508 ft., Cockfield 1,545 ft., Wilcox 3,648 ft., Midway 6,685 ft.
Grant Parish: Carter Oil 1 McGenty, SE SE 20-7-1, dry, T.D. 4,712 ft., Cane River 2,570 ft., Wilcox 2,755-82 ft.

Fields

Haynesville, Claiborne Parish: Midstates Oil 1-Aiken, SW NW 26-23-8w, flowed 154 bbl. in 7 hr. through choke, Pettit 5,445 ft., T.D. 5,575 ft.
Ohio Oil 3 Hunt 3-P, SW SW 9-23-8w, flowed 49 bbl. an hr. through choke, Pettit 5,420 ft., T.D. 5,480 ft.

(Continued on Page 95)

CANADIAN FIELDS

Accelerated Development Planned for Northwest

By VICTOR LAURISTON

CHATHAM, Ont.—Accelerated development of the Fort Norman field on the Mackenzie River, 1,155 miles due north of Edmonton, will be undertaken this summer. The federal government is cooperating with Imperial Oil in the development. Ronald McKinnon of the Imperial production department at Calgary, with a party of 23 men, will leave Edmonton by plane for Fort Norman as soon as flying conditions permit, to take charge of the operations. The program contemplates the immediate drilling of two or three wells, the results from which will furnish a guide to further possible development.

Operations will likely include reconditioning and possibly deepening of existing producers with a view to increasing production. There are four producing wells with an estimated potential around 400 bbl. daily, though the actual output has not been stepped up to that figure.

The original small refinery in the field was reconstructed and enlarged in 1939 at a cost of approximately $150,000; and since 1940 has been producing 87-octane aviation gasoline. The plant has a crude capacity around 750 bbl. every 24 hours, and turns out also 80-octane gasoline, light diesel fuel which is used on northern river craft, heavy diesel fuel, motor gasoline, and heating oil. Field and refinery operations will start early in June.

It is expected a survey will be made for a pipe line from the Fort Norman field to Whitehorse, Yukon Territory; which may be followed by erection at Whitehorse of a refinery to produce aviation gasoline and other products for the upper end of the Alaskan Highway, slightly over 400 miles distant.

Peace River Block

Details of arrangements for development in the Peace River block of northern British Columbia are now being worked out between the federal and provincial governments; following acceptance by the former of the provincial offer of the oil resources of this area free of royalty and taxes for the duration of the war. Drilling operations will be undertaken this summer. Provincial Government 1 well at Commotion Creek has already been drilled to approximately 6,000 ft. without securing commercial production, but development will now be accelerated and extended. The potential field is quite close to the Alaska Highway route.

Tar Sand Investigation

An inspection party sponsored by the Dominion Government at Ottawa has returned from an investigation of the Athabaska tar-sand area in northern Alberta. The party included W. S. Kirkpatrick of Calgary, representing the Consolidated Mining & Smelting Corp.; G. C. Ommaney of Montreal, development commissioner of the Canadian Pacific Railway; G. M. Hutt, assistant development commissioner, and Fred V. Siebert, industrial commissioner of the Canadian National Railways, both of Winnipeg; E. A. Smith, petroleum technologist for the Canadian Oil Companies, Ltd., of Petrolia; Dr. G. S. Hume of Calgary, representing the federal oil controller; Max W. Ball, president, and C. V. Humphreys, refining engineer, of Abasand Oils, Ltd. The committee investigated the whole situation with special attention to the major problem of economical mining of the deposits; and will make a report to the federal government including specific recommendations as to whether or not development should be undertaken.

Alberta Crude Production

Crude and natural-gasoline production from all Alberta fields for the week ending May 18 averaged 28,249 bbl. daily compared with 28,666 bbl. daily for the previous week and 26,939 bbl. daily for the corresponding week last year. The daily average included 27,105 bbl. of crude and 811 bbl. of natural gasoline from Turner Valley and 333 bbl. of crude from outside fields.

Turner Valley Lime Tests

North Turner Valley: Foothills Oil & Gas 12, LSD 4, 9-21-3w5, total depth 8,056 ft., Madison at 7,095 ft., reached a flush of 1,200 bbl. daily.

West Central section: Calmont-Northwest 5, LSD 6, 18-19-2w5, total depth 7,603 ft., Madison 7,156 ft., flowing about 288 bbl. daily.

Drillers & Producers 2, LSD 12, 7-19-2w5, total depth 8,263 ft., Madison at 7,836 ft., 400 bbl. daily.

Royalite Oil 63, LSD 8-9, 7-19-2w5, total depth 7,350 ft., Madison at 6,892 ft., has increased production from 300 bbl. temporary allowable to 350 bbl. daily.

North Extension Prospects

Abandonment of Ace Royalties 2, LSD 10, 22-22-4w5, in the lower Benton at 8,244 ft. has resulted in a general slackening of activity in Township 22-4w5, with five tests shut down at varying depths. Ace 2 was abandoned because it seemed improbable that the producing horizon in the lime would be reached above the water level indicated in several South Turner Valley west-flank wells. It was approximately 3,900 ft. below sea level, though other wells to the south yield crude at more than 4,800 ft. below. Among the wells north of the proven area, Major 12, LSD 4, 36-21-3w5, seems likely to get the lime at practicable depth, and few of the tests farther north have been carried deep enough to give definite information as to the immediate localities. It is possible that the main structure may lie to the east of some of the tests drilled in Township 22. Farther north, Inland-Sarcee 1, LSD 2, 4-23-4w5, the most northerly active test, indicates a possible change from the Benton formation below 6,500 ft. which, if confirmed, would indicate probabilities of the lime at practicable depth.

Pouce Coupe Test

On the Pouce Coupe structure in the northern foothills, Guardian Oil 1, 7-80-12w6, standing at 7,000 ft., is making production tests of various potential horizons, to locate the source of light green crude seeping into the hole. Systematic tests are being made of numerous shows encountered. D. P. Goodall of the Alberta Lands and Mines Department and Charles Stelke, British Columbia government engineer, are on hand to watch developments, which will have an important bearing on developments in the Peace River-Pouce Coupe areas of the two provinces. North and west of Guardian 1, Bonanza Royalties 1, LSD 16, 22-80-13w6, is below 990 ft. after coring a sand with gas and oil shows between 647 and 765 ft.

Wainwright Field

In the Wainwright field, east central Alberta, Wainwright Development 1, LSD 8, 17-45-6w4, indicated a fair pumper around 2,287 ft., about 40 bbl. daily, free of water and sulfur. It is being cored another 150 ft. for larger production.

In the Castor area, eastern Alberta, Shell Exploration Co. 1 has been definitely located in LSD 5, 28-37-13w4, and will spud early in June. This is a joint test by Shell Exploration and Chinook Oils, sponsored by R. A. Brown and associates of Calgary, sharing costs and results 50-50. Heavy-duty rotary will be used with production horizon expected around 5,000 ft. Previous tests in the general area by Hudson's Bay Oil & Gas Co. to depth of 4,675 ft. encountered oil and gas shows with lime at 3,613 ft.

Twin River Producer

In the Twin River area, southern

LEGAL

United States Department of Agriculture, Farm Security Administration, Lincoln, Nebraska, May 22, 1942. Sealed bids, in triplicate, will be received until 2 P.M., C.W.T., June 29, 1942, and then publicly opened, offering bonus for operating rights in connection with gas and oil leases on approximately 520 acres of land known as the Falls City Farmsteads, Richardson County, Falls City, Nebraska. Award of lease will be made only to bidder who can show sufficient experience and financial resources and prove citizenship. Bid documents may be obtained from Donald R. Harvey, Farm Security Administration, 900 No. 16 Street, Lincoln, Nebraska.

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Alberta, Del Bonita Associated 3 looks like a commercial producer. The unfinished well was taken over last year by Paragon Oil Co., deepened to 4,000 ft., acidized lightly, and bottom water plugged off. After standing through the winter it was cleaned and swabbed blowing gas freely with considerable water free crude. It is being further acidized, and given a definite production test. Crude is around 34°. Paragon Oil Co. is unloading equipment to deepen the old Nordon-Roney well to test the lime.

Vermilion Field

In the Vermilion field, eastern Alberta, Midfield Petroleum Development 1, LSD 6, 14-50-6w4, finished a dry hole. Location was somewhat west of the field. The company is preparing to drill Nos. 2 and 3 in the Borrodaile area. Northwest Co. is carrying on seismograph surveys in the Derwent section.

Manitoulin Island

On Manitoulin Island in Georgian Bay, G. F. Gregory & Son of Petrolia recently completed a test to 1,393 ft., a record depth for this area. Rig has been moved to a new location for a second well.

Gaspe Drilling

Quebec interests associated with Imperial Oil have abandoned their first test at 6,000 ft., failing to get production. No. 2 has been started about 30 miles east of No. 1, and is below 3,000 ft. The Gaspe Peninsula, south of the St. Lawrence River, at one time had a small production of shallow crude, and intermittent efforts have since been made to develop deep production.

ONTARIO COMPLETIONS

Malahide Township: Union Gas Co. 86, Lot 25, Concession 6, T.D. 1,078 ft., 260,000 cu. ft.

Union Gas 88, Lot 20-7, T.D. 1,103 ft., dry.

Central Pipe Line Co. 1 Ingram, Lot 21-1, shallow test, T.D. 270 ft., dry.

Mersea Township: Dominion Natural Gas, Lot 233, Talbot Road, T.D. 1,065 ft., dry.

Delaware Township: Union Gas 4, Lot 6-1, T.D. 1,256 ft., dry.

Moulton Township: P. L. Jackson-Roat, Lot 3-2, T.D. 735 ft., 35,000 cu. ft.

Walpole Township: Dominion Natural Gas 2 Parkinson, Lot 13-10, T.D. 890 ft., 78,000 cu. ft.

Raleigh Township: Prairie Oil & Gas-Bruette, Lot 5, Front Concession, Trenton test, T.D. 3,285 ft., dry.

Yarmouth Township: Dominion Natural Gas 1 Hepburn, Lot 7-5, T.D. 1,315 ft., dry.

Union Gas 87, Lot 27-8, T.D. 1,008 ft., dry.

Chatham Township: Union Gas 60, Lot 22-8, T.D. 1,817 ft., dry.

Union Gas 61, Lot 13-10, T.D. below 1,900 ft., dry.

Union Gas 62, Lot 19-6, T.D. below 1,900 ft., dry.

Sherbrooke Township: E. Neice, Lot 12-2, T.D. 910 ft., 300,000 cu. ft.

Wainfleet Township: W. C. Patterson-Bodgranick, Lot 15-3, T.D. 805 ft., 300,000 cu. ft.

Virginia Added to List of Oil-Producing States

BRISTOL, Va.—Virginia was added to the list of oil-producing states last week when commercial production of high-gravity oil was found just across the line and approximately 40 miles east of production in Kentucky.

Eisel et al 1 Fugate, south of the town of Rose Hill in the southwestern part of Lee County, was drilled to 1,115 ft., 2 ft. in Trenton lime when oil rose in the hole. On pumping test the well made 50 bbl. of 45.5-gravity oil. A railroad through Rose Hill, some 3 miles from the well, facilitates transportation of the crude to Louisville for refining. A price of $3.10 per barrel was paid for the high-gravity oil in Louisville, it was reported.

On a later test, the well was reported as pumping 20 bbl. Eisel and associates have moved 200 yds. to the southeast and staked 2 Fugate. The new test is near an old well drilled by a Lee County syndicate to 1,435 ft. which reported showings, although it was not completed as a commercial well. Oil is reported to be standing 145 ft. from the surface in this well but work is halted by legal trouble.

Virginia Discovery May Open Up New Province

The reported discovery of oil in the Trenton in Lee County, Virginia, is of considerable interest outside of the fact that it may open up the twenty-fourth state to oil production. The area lies in the Appalachian Mountains on a line which the carbon-ratio theory placed as the eastern limit of commercial production.

This theory states that if the fixed carbon amounts to more than 70 per cent of the total carbon plus volatile matter there will be no oil nor gas. If it lies between 65 and 70 per cent, shows or small pockets may be found but there will be no commercial production. Between 60 and 65 per cent, commercial pools are rare but the oil is exceptionally high grade when found. Gas wells are common, but are generally isolated. Lee County, Virginia, is the only part of the state lying between the 60 and 65 per cent isocarb contours. Cabin Creek in West Virginia lies across the 60 per cent isocarb and is the only oil field in the Appalachian area that does.

It is difficult to understand why carbon ratios in coals of Pennsylvanian age should govern the occurrence of oil in the Berea, which is of lower Mississippian age and has suffered more metamorphism than the overlying coals. It is still harder to visualize the relation between Pennsylvanian coal and Ordovician oil in an area such as the southwestern tip of Virginia. Here there is a strong unconformity at the top of the Clinton (Lower Silurian) and in places all of the rest of the Silurian and the Lower and Middle Devonian have been cut out. There are also unconformities above every formation from the top of the Clinton down to the top of the Lowville limestone which underlies the Trenton.

Rose Hill lies on a great fault block which has been thrust to the west at the extreme west edge of the highly folded Appalachians. This block extends along the mountain front for 125 miles and overlies Pennsylvanian rocks so that it would be possible to drill through it and find other pays of later age beneath. The underlying rocks lie in a highly folded trough which extends southward into northeastern Alabama where bituminous rocks are reported in the Chester series. To the north it broadens into the Charleston, W. Va., district and contains Cabin Creek and a number of gas fields. The great gas field of eastern West Virginia, which produces mainly from Devonian shales lies a short distance to the west. Discovery of oil in this area may thus open up a belt for prospecting over 500 miles long along the western front of the Appalachians.

La-Arkansas Fields

(Continued from Page 93)

Lisbon, Claiborne Parish: Union Producing Co. 1 McDonald, SW NE SW 13-21-5w, pumped 15 bbl., 50.5-gravity distillate, small flow gas, Buckner 11,470 ft., T.D. 12,592 ft, P.B. 11,725 ft.

Pine Island, Caddo Parish: J. M. Hayner et al 1 Conley-Garland, SE SW NW 8-21-15w, dry, T.D. 2,708 ft.

BOOK REVIEW

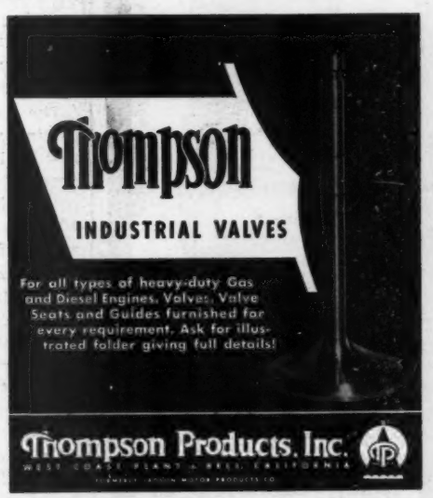
OIL IN THE EARTH, by Wallace E. Pratt. University of Kansas Press, Lawrence, Kans. 104 pp. Price $1.

During the nineteenth century popular interest in science was stimulated by the publication of nontechnical interpretations of scientific knowledge in the form of essays, lectures and books by men skilled in their subject and capable of presenting it in an easy, readable and interesting manner. Few such books appear today and one dealing with oil geology is particularly welcome. "Oil in the Earth" can be read with pleasure and profit by layman and geologist alike. From his wide experience, Mr. Pratt shows how belief in fallacies which stifle initiative has been thrown off by the practicing oil geologist and goes on to present some of his own concepts regarding the occurrence of oil, both regionally and locally, which deserve careful reading and will stimulate much constructive thought on the part of the reader.

Those acquainted with some of Mr. Pratt's other writings will recall his philosophical consideration of the reasons why American geologists have found more oil than those of all other nations combined. These are amplified in "Oil in the Earth" and from this he goes on to show that what has appeared to some to be profligate waste of an irreplaceable resource is only a wise use because in the not far distant future dwindling reserves will be replaced by an inexhaustible supply of synthetic material.

Following World War I there was a rash of books of the "We Fight for Oil" type. Mr. Pratt does not believe that the United States need fight for oil and as for the so-called "have nots," if they had sought oil with half the vigor that they use in fighting for it, they would probably have exportable surpluses.

"Oil in the Earth" will prove more thought-provoking than any present-day textbook, even of many times its length. It can be read in an hour but many paragraphs contain enough meat to furnish a textbook writer with a whole chapter.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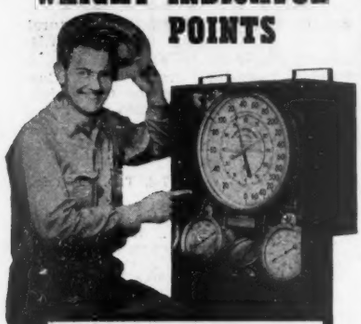

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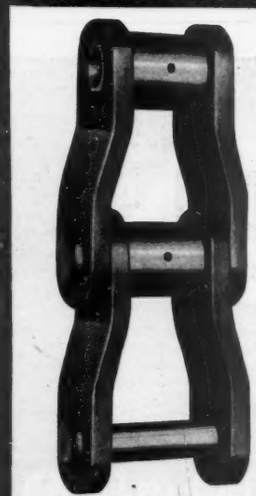

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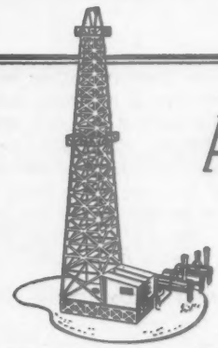

Among the Drilling

ODT Order No. 5 on Truck Hauling Postponed Until July 5

The Office of Defense Transportation has announced that full enforcement of its General Order No. 5 has been postponed from June 1 to July 1. This order in its original form required that all trucks must carry a 100 per cent load one way and a 75 per cent load the other way on any round trip.

However, that provision of the order requiring a 100 per cent load in at least one direction still prevails. The amended order still requires that the 100 per cent load be transported with the "flow of traffic." The full load one way permits the truck to operate the other way with a limited load, or no load at all, until July 1.

The American Association of Oil Well Drilling Contractors wrote Joseph B. Eastman, director of ODT, some time ago and outlined the drilling contractors' position in attempting to meet provisions of such a stringent order. In this letter it was explained that the movement of oil-well drilling equipment by motor truck necessitates use of motor equipment in many ways not common to other industries. The movement of oil-well drilling equipment from one location to another with a capacity load usually forces the return of motor trucks to their point of origin with a minimum load, it was shown.

The association is attempting to obtain relief for drilling contractors that will permit them to carry on normal hauling operations, while cooperating in every way possible with the Government toward conservation of rubber and equipment.

It is believed that no drilling contractor has provided transportation for his crews to and from location, with the provision that these crews should travel exclusively in the drilling contractor's conveyance. Such an agreement might make the drilling contractor liable for travel time to and from location. If transportation is furnished, contractors may desire to agree with employes on a rate of pay which will include a charge for travel time.

Unusual conditions brought about by shortage of rubber have prompted the pooling of transportation facilities by workmen going to and from drilling locations, and until now no serious difficulty has been reported.

Attention has been called to the fact that oil producers may be asked to pay additional travel time to roustabouts or other employes who were transported to and from the job by the employer, where there was no agreement as to the rate for such travel time. In a number of instances the employe has been paid a fixed rate or certain amount for travel time, but such payment did not equal the rate of pay received while on the job.

●

PETROLEUM WELLS Service Co., Houston, Tex., is nearing contract depth on Irene Allen et al 1 Davidson, a projected 4,000-ft. test located about 12 miles northwest of Brookshire, Waller County, Texas.

THREE WAY Drilling Corp., Wichita, Kans., has contract for P. V. Vaughn et al 1 Siabach, a wildcat in NW NW SW 2-20-5w, 4 miles northeast of the Bornholdt pool in McPherson County, Kansas. Pits and cellar have been completed and operators are ready to move in rotary tools. A few shallow gas wells have been drilled in this area.

HOUSTON Drilling Co., extended the new South Ganado field, Jackson County, Texas, several hundred feet as preparations were being made to complete Gulfboard 2 Harmon. Drill-stem testing in the discovery pay recovered pipe-line oil and 5½-in. casing was cemented on bottom at 5,394 ft.

RUSSELL & BECKHAM, McCamey, Tex., have contract for drilling Culberson & Irwin and Universal Consolidated Oil Co. 1 Hale, C SW SE 11-19s-30e, Eddy County, New Mexico, 2½ miles southwest of the Vandagriff discovery producer which was completed recently 1½ miles southwest of production in the Shugart field. The Vandagriff discovery, drilled by Culberson & Irwin, Inc., Midland, Tex., and Sam Sanders, Artesia, N. M., is in 6-19s-31e, has not been tested but oil rose 1,700 ft. in the hole in drilling to 3,447 ft.

FAIN Drilling Co., Houston, Tex., opened gas-distillate production from a new sand in the old Refugio field, Refugio County, Texas, with the completion of Sunray 6 Mitchell. Completion was made by perforating opposite sand at 8,400 ft. In Matagorda County, Texas, a protection string of 9⅝-in. casing was cemented in Stanolind 1 Buckners Orphan Home at 7,156 ft. In the Cistern area, Fayette County, Texas, Continental 1 Gabitzsch was expected to be completed for a gasser in the Wilcox sand at 2,800 ft. Two other operations are reported in the Maurbro and Rincon fields for Stanolind Oil & Gas Co. and Continental Oil Co.

T. G. M. Drilling Co. is moving a rotary to Jim Wells County, Texas, for Hickok & Reynolds 1 W. O. Staples, a wildcat located 1 mile northwest of the Magnolia field. The location is about 5,000 ft. northwest of Pure 1 Reynolds, a gas well.

C. C. GILGER, Houston, Tex., contractor, has started moving equipment to location for C. R. Starnes 1 Matt Spencer, an east outpost to the Chapel Hill field in eastern Smith County, Texas. The new well is to be an offset to Starnes 1 Jackson,

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Contractors

which was completed in the Pettit lime as a mile-south extension on the east side of the gas-distillate field. The contractor has another string of tools engaged at a location in the Kildare field, Cass County, Texas, where his first well, drilled on acreage received as part consideration for the discovery producer, has been successfully completed.

JACK FRAZIER, Houston, Tex., received contract from W. F. Bowman for 1 Louis Lobit, a wildcat located in the Neatherly Survey, Liberty County, Texas.

FALCON-SEABOARD Drilling Co., Houston, Tex., is moving a rotary to the Gibson field, Terrebonne Parish, Louisiana, for Shell Oil Co., Inc., where contract was received for a deep test. Two rotaries are running in the Midway field, Arkansas, for Barnsdall Oil Co., while in Kansas, drilling continues on two wildcats which are being drilled for the company. In West Virginia drilling was started on the first of four salt-water wells which will be drilled for the Defense Plant Corp. Contract depth is 6,800 ft.

MORRIS-HAMILTON, Houston, Tex., has reached an interesting depth on Phillips Petroleum Co. wildcat, located in the Pentias area, southern Hidalgo County, Texas.

WYNN CROSBY Drilling Co., Houston, Tex., is moving a rotary to the Lissie area, Wharton County, Texas, for a recompletion of the company's 1 Poole. The well was completed several months ago as a gas-distillate producer in the Wilcox formation at approximately 9,700 ft. A series of tests are scheduled to be made in other sands in the Wilcox that showed up favorable on an electrical survey.

MUSKEGON Development Co., Muskegon, Mich., has been awarded the contract for United Drillers & Producers 1 Blohm, Bay County, Michigan, located in N½ NW SW 28-15n-4e.

LUPHER Drilling Co. has contract for Pure Oil Co. 1 D. G. Thompson, Clare County, Michigan, N½ NW SE 3-20n-3w.

ASHBY Drilling Co. has contract for Taggert Brothers Co. 37 Cook-Duddles, Osceola County, Michigan, C SW 9-18n-10w. The company also has contract for Taggert Brothers Co. 36 Duddles-State et al, in Osceola County, C NW 16-18n-10w.

SEIMONEIT Drilling Co. has the 4,600-ft. contract for Neville Penrose 1 University, about midway between the West Fuhrman area and Seimoneit Drilling Co. 1 University, Section 3-10-U, West Ward County, Texas. Site of the Penrose test is 614 ft. from the north and 678 ft. from the east lines of the section.

BUTLER HORNE Drilling Co.'s 1 C. H. Hudson, a Taylor County, Texas, test that will attempt to link the Wimberley and Merkel pools, last week was drilling past 400 ft. Located 1½ miles south of the Wimberly pool, it is 330 ft. from the north and east lines of Lot 3, J. A. Nabors Survey 9.

TAYLOR Drilling Co. has the contract for a test Gage County Developing Co., Gage County, Nebraska, has staked in SW SW SW of 14-1n-6e, 4 miles east of Odell, on a block assembled by Don Linn and associates.

MISSISSIPPI, a comparative newcomer among the oil-producing states, is fast developing into one of the nation's largest. The state now stands eighth among the oil-producing states, and holds the rank of fourth in the South.

CROWE Drilling Co., Hoisington, Kans., was drilling below 350 ft. at Derby Oil Co. 1 Watson, a wildcat test in SE SE 29-17n-4e, 2½ miles southwest of the Lost Springs pool in Marion County, Kansas.

COMMERCIAL Drilling Co., Tulsa, is the contractor for a wildcat in the Greater Seminole field, Oklahoma, which Fred T. Haddock and Kenneth Moore, operators of Tulsa, will drill in C SE NE 23-9n-5e. The well will be the 1 Dr. J. N. Harber. The test will seek to extend eastward the South Earlsboro pool, a two-county area. The Wilcox sand is believed to exist around 4,200 ft.

MARTIN & MANNING, Denver, Colo., was building derrick on Texas Co.'s Texaco-Kingsburg, C SE SE in the Dupuyer district of Montana, and rotary equipment was being moved onto location. It is 660 ft. off the highway.

●

Crew of Phillips Petroleum Co., at East Tecumseh, Oklahoma. The men are: Paul Graves, driller; J. O. Taylor, motorman; E. W. Hill, derrickman; and P. L. Morrel, pipe racker

Urge Contractors to Send In Inventory Forms

THE American Association of Oilwell Contractors in its latest bulletin urges its members to send in their inventory forms, since the consolidation of this information will make possible necessary replacements for the drilling contractor. Mr. Brantley, president of the association, recently received a letter from the chief of the Petroleum Machinery and Equipment Section of the War Production Board, indicating that the section is vitally interested in obtaining a copy of the inventory so that it may know what types and kinds of equipment and material are now within the industry, and what types will be needed in the near future.

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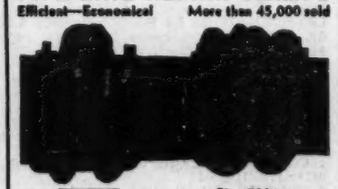

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21-21.9	...	...	...	...	.87	.78	...
22-22.9	...	...	...	...	.89	.81	...
23-23.9	...	...	...	...	.91	.84	...
24-24.9	...	...	...	...	.93	.87	...
Below 25	$.93	...	...	$.86	...	...	...
25-25.9	.95	$.95	...	.88	.95	.90	...
26-26.9	.97	.97	...	.90	.97	.93	...
27-27.9	.99	.99	...	.92	.99	.96	...
28-28.9	1.01	1.01	$1.01	.94	1.01	.99	...
29-29.9	1.03	1.03	1.03	.96	1.03	1.02	...
30-30.9	1.05	1.05	1.05	.98	1.05	1.05	$1.05
31-31.9	1.07	1.07	1.07	1.00	1.07	1.07	1.07
32-32.9	1.09	1.09	1.09	1.02	1.09	1.09	1.09
33-33.9	1.11	1.11	1.11	1.04	1.11	1.11	1.11
34-34.9	1.13	1.13	1.13	1.06	1.13	1.13	1.13
35-35.9	1.15	1.15	1.15	1.08	1.15	1.15	1.15
36-36.9	1.17	1.17	1.17	1.10	1.17	1.17	1.17
37-37.9	1.19	1.19	1.19	1.12	1.19	1.19	1.19
38-38.9	1.21	1.21	1.21	1.14	1.21	1.21	1.21
39-39.9	1.23	1.23	1.23	1.16	1.23	1.23	1.23
40 and above	1.25	1.25	1.25	1.18	1.25	1.25	1.25

OKLAHOMA AND KANSAS TABLE EXPLANATION

COLUMN (1) MID-CONTINENT GRADES:
Pure Oil Co., 5-20-41.
Gulf Oil Corp., 5-20-41.
Skelly Oil Co. (Kansas only), 5-19-41.
H. F. Wilcox Oil & Gas Co., 5-20-41.

COLUMN (2) MID-CONTINENT GRADES:
White Eagle Oil Purchasing Co., Inc., 5-19-41, Kansas only.
Sinclair Prairie Oil Marketing Co., 5-20-41.

COLUMN (3) MID-CONTINENT GRADES:
Continental Oil Co., 5-19-41.
Phillips Petroleum Co., 5-19-41.
Tide Water Associated Oil Co., 5-20-41.

COLUMN (4) JACKSON, TILLMAN COUNTIES:
Gulf Oil Corp., 5-20-41.

COLUMN (5) MID-CONTINENT GRADES:
Standard Oil Co. (Indiana), 5-20-41.
National Refining Co., 5-20-41.

COLUMN (6) MID-CONTINENT GRADES:
Magnolia Petroleum Co., 5-21-41.
Shell Oil Co., Inc., 5-19-41.
Shell, in Carter County, 12-5-41.
Ben Franklin Refining Co., 12-4-41.
Carter Oil Co. (Oklahoma only), 5-19-41.

COLUMN (7) OKLAHOMA:
Champlin Refining Co., 5-20-41.

OKLAHOMA FLAT PRICE

Cumberland $1.14
Pure Oil Co., 9-4-41.

MIDDLE WEST FLAT PRICES

Illinois and Indiana

Ohio Oil Co.:
Illinois basin, 5-21-41 ..... $1.37
Eastern Illinois, 5-21-41 ..... $1.22
Western Indiana, 5-21-41 ..... 1.22
Magnolia Petroleum Co.:
Illinois basin, 5-21-41 ..... $1.37
Carter Oil Co.:
Illinois (Louden), 5-21-41 ..... $1.37
Sohio Corp.:
Illinois basin, 5-21-41 ..... $1.37
Texas Co.:
Illinois basin 5-21-41 ..... $1.37
Gulf Refining Co.:
Illinois basin 5-21-41 ..... $1.37

Michigan

Simrall Corp., 5-27-41:
Greendale, Porter, Vernon, Crystal, and Wise $1.44
Buckeye, Bentley, Edenville, Beaverton, and Monitor (sweet) 1.42
Freeman, Redding, Lincoln, and Winterfield 1.39
Hamilton-Grout 1.29
West Branch-Arenac 1.24
Sohio Corp., 5-1-41:
Bloomingdale-Columbia $1.38
Mid-West Refineries, Inc., 5-1-41:
Kent County $1.38
Pure Oil Co., 5-27-41:
Sherman $1.39
Midland (Midland County) 1.44

EASTERN STATES

Pennsylvania and Ohio

South Penn Oil Co.:
National lines, 3-26-42 ..... $3.00
Southwest Penn, 3-26-42 ..... 2.65
Eureka lines, 3-26-42 ..... 2.59
Corning grade, 5-27-41 ..... 1.31
Tide Water Associated Oil Co.:
Bradford, 3-26-42 ..... $3.00
Allegany, N. Y., 3-26-42 ..... 3.00
Pennzoil Co.:
Group A, 3-26-42 ..... $2.93
Group B, 3-26-42 ..... 2.92
Group C, 3-26-42 ..... 2.91
Group D, 3-26-42 ..... 2.90
Group E, 3-26-42 ..... 2.88
Quaker State Oil Refining Corp.:
In Buckeye lines, 3-26-42 ..... $2.55
In Eureka lines, 3-26-42 ..... 2.59

West Virginia

Pure Oil Co.:
Cabin and Kelly Creek, 3-27-42 .. $2.59
Pure Oil Co.:
Bosco (5-21-41) $1.14
Sweet Lake (5-22-41) 1.06
Creole (5-22-41) 1.16
Republic Oil Co., 6-2-41:
Nevada County, Arkansas $0.80
Shell Oil Co., Inc., 5-20-41:
Happytown $1.15
Standard Oil Co. of Louisiana, 5-22-41:
Big Creek, Dorcheat, McKamie (sour) $1.15
Smackover (heavy) ..... .83
Cotton Valley distillate (9-1-41) .. 1.40
Cotton Valley (Holloway sand) .. 1.25
Lisbon distillate 1.20
Republic Oil Refining Co., 5-21-41:
Bayou Pigeon $1.20
Texas Co., 5-21-41:
Erath $1.21
Garden Island 1.36
Lafitte, Paradis 1.19
Lake Mongoulois 1.36

ROCKY MOUNTAIN GRAVITY TABLE

Below 29	$0.96
29-29.9	.98
30-30.9	1.00
31-31.9	1.02
32-32.9	1.04
33-33.9	1.06
34-34.9	1.08
35-35.9	1.10
36-36.9	1.12
37-37.9	1.14
38-38.9	1.16
39-39.9	1.18
40 and above	1.20

Stanolind Oil & Gas Co., 5-20-41, includes Dutton Creek, Midway, and Salt Creek except Tensleep crude, Wyoming.
Sinclair-Wyoming Oil Co., 5-20-41, includes Salt Creek and Lost Soldier, except Tensleep crude, Wyoming.
Continental Oil Co., 5-21-41, includes Fort Collins and Wellington, Colorado.

Wyoming

Ohio Oil Co.:
Rock River (5-20-41) $1.15
Lance Creek (7-1-41) 1.12
Elk Basin and Grass Creek (light) 1.00
Stanolind Oil & Gas Co., 5-20-41:
Frannie (light) ..... .70
Frannie (heavy) ..... .47
Grass Creek (light) 1.00
Grass Creek (heavy) ..... .50
Hamilton dome ..... .45
Elk basin 1.00
Salt Creek (Tensleep) ..... .6785
Continental Oil Co.:
Big Muddy (5-30-41) $1.08
Lance Creek (9-1-41) 1.12

TEXAS GULF COAST GRAVITY TABLES

	(1)	(2)	(3)	(4)	(5)
Below 20	$1.06	$1.06	....	$.98	$.93
20-20.9	1.08	1.08	....	1.00	.95
Below 21	....	....	$1.08	....	....
21-21.9	1.10	1.10	1.10	1.02	.97
22-22.9	1.12	1.12	1.12	1.04	.99
23-23.9	1.14	1.14	1.14	1.06	1.01
24-24.9	1.16	1.16	1.16	1.08	1.03
25-25.9	1.18	1.18	1.18	1.10	1.05
26-26.9	1.20	1.20	1.20	1.12	1.07
27-27.9	1.22	1.22	1.22	1.14	1.09
28-28.9	1.24	1.24	1.24	1.16	1.11
29-29.9	1.26	1.26	1.26	1.18	1.13
30-30.9	1.28	1.28	1.28	1.20	1.15
31-31.9	1.30	1.30	1.30	1.22	1.17
32-32.9	1.32	1.32	1.32	1.24	1.19
33-33.9	1.34	1.34	1.34	1.26	1.21
34-34.9	1.36	1.36	1.36	1.28	1.23
35-35.9	1.38	....	1.38	1.30	1.25
36-36.9	1.40	....	1.40	1.32	1.27
37-37.9	1.42	....	1.42	1.34	1.29
38-38.9	1.44	....	1.44	1.36	1.31
39-39.9	1.46	....	1.46	1.38	1.33
40 and above	1.48	....	1.48	1.40	1.35

TEXAS GULF COAST GRAVITY TABLE EXPLANATION

COLUMN (1):
Humble Oil & Refining Co., 5-21-41, includes Amelia, Clear Lake, Goose Creek, Hastings, Magnet, Mykawa (new), Raccoon Bend, South Thompsons Sugarland, Thompson, and Webster fields.
Stanolind Oil & Gas Co., 5-21-41, includes West Beaumont, High Island, and Spindletop.
Sinclair Prairie Oil Marketing Co., 5-21-41.
Stanolind Oil Purchasing Co., 4-1-41, includes Clinton where schedule starts at 98 cents for below 21°, regular thereafter.
Pure Oil Co., 4-21-41, includes Louise and Ganado.
Gulf Refining Co., 5-21-41, includes Spindletop, Sour Lake, Lovells Lake, West Beaumont, Goose Creek, South Liberty, Big Creek, Blue Ridge, Fannett, Moore, Barbers Hill, Hankamer, Thompson, Lochridge, Dyersdale, and Hull (old).
Sun Oil Co., 5-21-41, includes Barbers Hill, Batson (old), Bayou Blue, Chacahoula, Cotton Lake, Esperson (below 35° gravity), Fausse Point, Goose Creek, Greens Lake, Hackberry (east and west), Hull (below 25°), Humble (below 35°), Nome, North Dayton (below 25°), Orange, Saratoga, Sour Lake, South Liberty, and Vinton.
COLUMN (2):
Texas Co., 5-21-41, includes Arriola, Ganado, Hamman, Hillje, Humble, Kubela, Magnet, Manvel, Markham, Mauritz, Old Ocean, Pickett Ridge, Port Neches, Sour Lake, West Columbia, and Withers.
COLUMN (3):
Pan American Production Co., 5-21-41 includes Hastings and South Houston.

LOUISIANA AND SOUTHERN ARKANSAS GRAVITY TABLE

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Below 18	....	....	....	....	....	....	....	....	....	....	....	....	$.94	....	....	....	....	....
18-18.9	....	....	....	....	....	....	....	....	....	....	....	....	.96	....	....	....	....	....
19-19.9	....	....	....	....	....	....	....	....	....	....	....	....	.98	....	....	....	....	....
Below 20	....	....	....	....	....	....	....	$1.06	....	$.94	$.99	$.89	....	....	$1.06	....	....	....
20-20.9	....	....	....	....	....	....	....	1.08	....	.96	1.01	.91	1.00	....	1.08	....	....	....
Below 21	$.68	....	....	$.90	....	....	....	....	....	....	....	....	....	$.90	....	....	....	....
21-21.9	.70	....	....	.92	....	....	....	1.10	....	.98	1.03	.93	1.02	.92	1.10	....	....	....
22-22.9	.72	....	....	.94	....	....	....	1.12	....	1.00	1.05	.95	1.05	.94	1.12	....	....	....
23-23.9	.74	....	....	.97	....	....	....	1.14	....	1.02	1.07	.97	1.08	.96	1.14	....	....	....
24-24.9	.76	....	....	.98	....	....	....	1.16	....	1.04	1.09	.99	1.11	.98	1.16	....	....	....
Below 25	....	$.86	$.98	....	....	$.88	....	....	....	....	....	....	....	....	....	....	....	....
25-25.9	.78	.88	1.00	1.00	....	.90	....	1.18	....	1.06	1.11	1.01	1.14	1.00	1.18	....	....	....
26-26.9	.80	.90	1.02	1.02	....	.92	....	1.20	....	1.08	1.13	1.03	1.17	1.02	1.20	....	....	....
27-27.9	.82	.92	1.04	1.04	....	.94	....	1.22	....	1.10	1.15	1.05	1.19	1.04	1.22	....	....	....
28-28.9	.84	.94	1.06	1.06	....	.96	....	1.24	....	1.12	1.17	1.07	1.21	1.06	....	$1.14	$1.06	....
29-29.9	.86	.96	1.08	1.08	....	.98	....	1.26	....	1.14	1.19	1.09	1.23	1.08	....	1.16	1.08	....
30-30.9	.88	.98	1.10	1.10	$1.26	1.00	....	1.28	....	1.16	1.21	1.11	1.25	1.10	....	1.18	1.10	$1.05
31-31.9	.90	1.00	1.12	1.12	1.28	1.02	....	1.30	$1.07	1.18	1.23	1.13	1.27	1.12	....	1.20	1.12	1.07
32-32.9	.92	1.02	1.14	1.14	1.30	1.04	....	1.32	1.09	1.20	1.25	1.15	1.29	1.14	....	1.22	1.14	1.09
33-33.9	.94	1.04	1.16	1.16	1.32	1.06	....	1.34	1.11	1.22	1.27	1.17	1.31	1.16	....	1.24	1.16	1.11
34-34.9	.96	1.06	1.18	1.18	1.34	1.08	....	1.36	1.13	1.24	1.29	1.19	1.33	1.18	....	1.26	1.18	1.13
35-35.9	.98	1.08	1.20	1.20	1.36	1.10	....	....	1.15	....	....	....	....	1.20	....	1.28	1.20	1.15
Below 36	....	....	....	....	....	....	$1.07	....	....	....	....	....	....	....	....	....	....	....
36-36.9	1.00	1.10	1.22	1.22	....	1.12	1.09	....	1.17	....	....	....	....	1.22	....	1.30	1.22	1.17
37-37.9	1.02	1.12	1.24	1.24	....	1.14	1.11	....	1.19	....	....	....	....	....	....	....	....	1.19
38-38.9	1.04	1.14	1.26	1.26	....	1.16	1.13	....	1.21	....	....	....	....	....	....	....	....	1.21
39-39.9	1.06	1.16	1.28	1.28	....	1.18	1.15	....	1.23	....	....	....	....	....	....	....	....	1.23
40 & above	1.08	1.18	1.30	1.30	....	1.20	1.17	....	1.25	....	....	....	....	....	....	....	....	1.25

LOUISIANA AND SOUTHERN ARKANSAS TABLE EXPLANATION

Standard Oil Co. of Louisiana, 5-22-41.
COLUMN (1) applies to Atlanta, Buckner, Magnolia, Schuler (Jones sand), Village, and Lewisville fields.
COLUMN (2) applies to De Soto, Sabine, Fouke, Homer, Miller County, Sugar Creek, and Nebo.
COLUMN (3) applies to Bunkie, Eola, Olla, and South Olla.
COLUMN (4) applies to Bayou Mallet, Choctaw, Darrow, Jeanerette, Lirette, North Crowley, South Crowley, Port Barre, Potash, Roanoke, St. Martinville, and Port Allen.
COLUMN (5) applies to University (Baton Rouge).
COLUMN (6) applies to Cotton Valley crude, Rodessa and Shreveport (Cross Lake); also Anse La Butte, effective 8-1-41, starting at 80 cents for below 21°, also, to Caddo effective 10-15-41.
Continental Oil Co., 5-21-41.
COLUMN (7) applies to Abbeville, Louisiana.
Continental Oil Co., 5-21-41.
Stanolind Oil & Gas Co., 5-21-41.
COLUMN (8) applies to East and West Hackberry.
COLUMN (6) applies to Caddo Parish, effective 10-15-41.
COLUMN (9) applies to Evangeline, Acadia Parish.
Lion Oil Refining Co., 5-22-41.
COLUMN (1) applies to Reynolds lime, Jones sand, Schuler, Ark.
COLUMN (2) applies to El Dorado, West and South Rainbow fields, Snow Hill, and Schuler-Morgan sand.
Placid Oil Co., 5-22-41.
COLUMN (3) applies to Olla.
COLUMN (2) applies to Nebo field.
Shell Oil Co., Inc., 5-20-41.
COLUMN (10) applies to Roanoke, Chalkley.
COLUMN (11) applies to Iowa, Black Bayou, White Castle.
COLUMN (12) applies to Gibson, South Houma, Hester, West Lake Verret.
Magnolia Petroleum Co., 5-21-41.
COLUMN (13) applies to Lockport, Cameron Meadows, and West Gueydan, La.
COLUMN (6) applies to Haynesville, Cotton Valley, Rodessa, La., and Miller County, Arkansas.
Phillips Petroleum Co., 3-29-41.
Arkansas Fuel Oil Co., 2-19-42.
COLUMN (1), Schuler (Jones sand), except schedule starts at 76 cents for below 25° gravity.
Gulf Refining Co., 5-21-41.
COLUMN (9), Jennings.
COLUMN (8), Edgerly, Starks, Vinton East Hackberry, Cameron Meadows, and Leesville.
COLUMN (16) applies to Grand Bay, Quarantine Bay, Timbalier Bay, and West Bay, except schedule starts at $1.12 for below 28° gravity.
COLUMN (6) applies to Caddo, Homer, Bull Bayou, Crichton, De Soto, Haynesville, and El Dorado.
Pure Oil Co., 4-22-41.
COLUMN (14) applies to Gueydan crude.
COLUMN (6), Caddo, Homer, Haynesville, Bull Bayou, Crichton, De Soto, and El Dorado.
Texas Co., 5-21-41.
COLUMN (6) applies to North Louisiana.
COLUMNS (15) and (16), Bay St. Elaine, Caillou Island, Iberia, Lake Barre, Lake Pelto, Leesville, Port Barre. (Schedules A and B).
COLUMN (17), Bateman Lake, Dog Lake, Fausse Point, Horseshoe Bayou Jefferson Island, Plumb Bob, Vermilion Bay, West Cote Blanche, and Delta Duck Club.
COLUMN (18), Delta Farm, Lake Salvador, Golden Meadow.

LOUISIANA AND ARKANSAS FLAT PRICES

Continental Oil Co., 5-21-41:
Tepetae and Lake Arthur $1.18
Ville Platte 1.20
Gulf Refining Co., 5-21-41:
Smackover (Ark.) $0.83
Lion Oil Refining Co., 5-22-41:
Smackover (heavy) $0.83
Dorcheat 1.15
Phillips Petroleum Co., 5-22-41:
Smackover (heavy) $0.83
Placid Oil Co., 5-22-41:
Tullos-Urania (5-21-41) $1.15
Cotton Valley dist. (above 60°) 1.30
Cotton Valley (Holloway sand) .. 1.25
Cotton Valley (Bodcaw-D sands) 1.20

Stanolind Oil & Gas Co., 4-1-41, includes High Island, Spindletop, Hastings, and South Houston.

COLUMN (4):

Humble Oil & Refining Co., 5-21-41, includes Anahuac, Angleton, Cedar Point, Fishers' Reef, Hull (new and old), Pierce Junction, Red Fish Reef, and Turtle Bay.

Gulf Refining Co., 5-21-41, includes Anahuac, Hull (new), Thompson (deep), Pierce Junction, and Orange.

Sun Oil Co., 5-21-41, includes Anahuac, Caplen and Turtle Bay.

Humble Oil & Refining Co., 3-29-41, includes Dickinson, Gillock, Hardin, League City, and Rowan.

COLUMN (5):

Pan American Production Co., 5-21-41, includes Gillock, except scale starts at 95 cents below 21°.

Stanolind Oil Purchasing Co., 5-21-41, includes Fairbanks, North Houston, and Roslyn.

SOUTH TEXAS AND SOUTHWEST TEXAS GRAVITY TABLES

	1	2	3	4	5	6	7
Below 20	$1.03	$1.08	$1.08	$.89	$1.03	$1.03	$1.08
20-20.9	1.05	1.10	1.10	.90	1.05	1.05	1.10
21-21.9	1.07	1.12	1.12	.91	1.07	1.07	1.12
22-22.9	1.09	1.14	1.14	.92	1.09	1.09	1.14
23-23.9	1.11	1.16	1.16	.93	1.11	1.11	1.16
24-24.9	1.13	1.18	1.18	.94	1.13	1.13	1.18
25-25.9	1.15	1.20	1.20	.95	1.15	1.15	1.20
26-26.9	1.17	1.22	1.22	.96	1.17	1.17	1.22
27-27.9	1.19	1.24	1.24	.97	....	1.19	1.24
28-28.9	1.21	1.26	1.26	.98	....	1.21	1.26
29-29.9	1.23	1.28	....	.99	....	....	1.28
30-30.9	1.25	1.30	....	1.00	....	....	1.30
31-31.9	1.27	1.32	....	1.01	....	....	1.32
32-32.9	1.29	1.34	....	1.02	....	....	1.34
33-33.9	1.31	1.36	....	1.03	....	....	1.36
34-34.9	1.33	1.38	....	1.04	....	....	1.38
35-35.9	1.35	1.40	....	1.05	....	....	1.40
36-36.9	1.37	1.42	....	1.06	....	....	....
37-37.9	1.39	1.44	....	1.07	....	....	....
38-38.9	1.41	1.46	....	1.08	....	....	....
39-39.9	1.43	1.48	....	1.09	....	....	....
40 and above	1.45	1.50	....	1.10	....	....	....

SOUTH AND SOUTHWEST TEXAS TABLE EXPLANATION

COLUMN (1) MIRANDO:

Humble Oil & Refining Co., 5-21-41, includes Blanchard Bridwell, Colorado, Comitas, Eagle Hill, Escobas, Fitzsimmons, Glen, Government Wells (North and South), Heyser, Hoffman, Kelsey, Kohler, Loma Novia, Lundell, Manila, Mirando Valley, Placedo, Randado, Sarnosa, and Tesoro.

Magnolia Petroleum Co., 5-21-41.

Continental Oil Co., 7-1-41. Includes Hoffman, Government Wells (North and South), Lopez, Moco, Colmena, Seven Sisters, South Seven Sisters, Loma Novia, Conoco Driscoll, O'Hern, Piedre Lumbre, and Taranchauas.

American Mineral Spirits Co., 5-21-41, includes Adami and Munson.

Republic Oil Refining Co., 5-21-41, includes Heyser field crude.

COLUMN (2) REFUGIO:

Continental Oil Co., 7-1-41, includes Minnie Bock, Clara Driscoll, South Clara Driscoll, Driscoll Ranch, Orange Grove, and Wade City.

Humble Oil & Refining Co., 5-21-41, includes East White Point, Greta, Melon Creek, O'Connor-McFaddin, Plymouth, Saxet, Taft, and Tom O'Connor.

American Mineral Spirits Co., 5-21-41, includes Plymouth, Taft, and East White Point.

COLUMN (3) REFUGIO:

Texas Co., 5-21-41, includes Greta, Saxet, and Taft.

COLUMN (4) LA ROSA:

American Mineral Spirits Co., 3-29-41.

COLUMN (5) DUVAL-MIRANDO:

Sun Oil Co., 5-21-41.

COLUMN (6) DUVAL-MIRANDO:

Texas Co., 5-21-41.

COLUMN (7) NUECES COUNTY:

American Mineral Spirits Co., 5-21-41.

Republic Oil Refining Co., 5-21-41.

WEST TEXAS, PANHANDLE AND NEW MEXICO TABLE EXPLANATION

COLUMN (1):

Humble Oil & Refining Co., 5-21-41, includes Andrews, Crane, Crockett, Ector, Gaines, Glasscock, Howard, Reagan, Upton, Winkler, and Yoakum counties, West Texas, and Lea County, New Mexico.

Gulf Refining Co., 5-21-41, includes Crane, Ector, Upton, Ward, and Winkler counties, West Texas.

COLUMN (2):

Sinclair Prairie Oil Marketing Co., 5-21-41, includes West Texas and Lea County, New Mexico. Effective 5-29-41 in Eddy County, New Mexico.

Magnolia Petroleum Co., 5-21-41, includes Upton, Howard, Glasscock, Mitchell, Winkler, Cochran, Hockley, Yoakum, and Gaines counties.

COLUMN (3):

Texas Co., 5-21-41, includes Crane and Winkler counties, Texas, and Lea County, New Mexico.

COLUMN (4) TEXAS PANHANDLE:

Magnolia Petroleum Co., 7-9-41.
Continental Oil Co., 7-9-41.
Phillips Petroleum Co., 7-9-41.

COLUMN (5) WINKLER AND LEA:

Stanolind Oil & Gas Co., 5-21-41, includes Winkler County only.

Gulf Refining Co., 5-21-41, includes Lea County, New Mexico, only

COLUMN (6) GRAY COUNTY:

Texas Co., 5-21-41.
H. F. Wilcox Oil & Gas Co., 7-9-41.

COLUMN (7) LEA COUNTY:

Magnolia Petroleum Co., 5-21-41.

COLUMN (8) EDDY COUNTY:

Continental Oil Co., 5-30-41.

COLUMN (9):

Shell Oil Co., Inc., 5-20-41, includes Crane, Ector, Howard, Glasscock, Upton, Winkler, and Yoakum counties, Texas, and Lea County, New Mexico.

COLUMN (10) TEXAS PANHANDLE:

Humble Oil & Refining Co., 7-9-41.

COLUMN (11) PANHANDLE:

Sinclair Prairie Oil Marketing Co., 5-23-41.

WEST TEXAS, PANHANDLE, AND NEW MEXICO GRAVITY TABLES

	1	2	3	4	5	6	7	8	9	10	11
Below 20	$0.70	....	....	....	....	....	....	....	$0.70	$0.73	....
20-20.9	.72	....	....	....	....	....	....	....	.72	.75	....
21-21.9	.74	....	....	....	....	....	....	....	.74	.77	....
22-22.9	.76	....	....	....	....	....	....	....	.76	.79	....
23-23.9	.78	....	$0.78	....	....	....	....	....	.78	.81	....
24-24.9	.80	....	.80	....	....	....	....	....	.80	.83	....
Below 25	....	$0.80	....	....	....	....	....	$0.80	....	....	$0.83
25-25.9	.82	.82	.82	....	$0.82	....	....	.82	....	.85	.85
26-26.9	.84	.84	.84	....	.84	....	....	.84	....	.87	.87
27-27.7	.86	.86	.86	....	.86	....	....	.86	....	.89	.89
28-28.9	.88	.88	.88	$0.91	.88	....	....	.88	$0.88	.91	.91
29-29.9	.90	.90	.90	.93	.90	....	....	.90	.90	.93	.93
30-30.9	.92	.92	.92	.95	.92	....	....	.92	.92	.95	.95
31-31.9	.94	.94	.94	.97	.94	....	....	.94	.94	.97	.97
32-32.9	.96	.96	.96	.99	.96	....	....	.96	.96	.99	.99
33-33.9	.98	.98	.98	1.01	.98	....	....	.98	.98	1.01	1.01
34-34.9	1.00	1.00	1.00	1.03	1.00	$1.03	1.00	1.00	1.00	1.03	1.03
35-35.9	1.02	1.02	1.02	1.05	1.02	1.05	1.02	1.02	1.02	1.05	1.05
36-36.9	1.04	1.04	1.04	1.07	1.04	1.07	1.04	1.04	1.04	1.07	1.07
37-37.9	1.06	1.06	....	1.09	1.06	1.09	....	1.06	....	1.09	1.09
38-38.9	1.08	1.08	....	1.11	1.08	1.11	....	1.08	....	1.11	1.11
39-39.9	1.10	1.10	....	1.13	1.10	1.13	....	1.10	....	1.13	1.13
40 and above	1.12	1.12	....	1.15	1.12	1.15	....	1.12	....	1.15	1.15

NORTH TEXAS, WEST CENTRAL TEXAS, EAST CENTRAL TEXAS GRAVITY TABLES

	1	2	3	4	5	6	7	8
Below 20	....	....	....	....	$.80	....	....	....
20-20.9	....	....	....	....	.82	....	....	....
Below 21	....	....	....	....	....	$.81	....	....
21-21.9	....	....	....	....	.84	.83	....	....
22-22.9	....	....	....	....	.86	.85	....	....
23-23.9	....	....	....	....	.88	.87	....	....
24-24.9	....	....	....	....	.90	.89	....	....
Below 25	....	....	$.88	....	....	....	$.89	$.95
25-25.9	$.91	....	.90	$.97	.92	.91	.91	.97
26-26.9	.93	....	.92	.99	....	.93	.93	.99
27-27.9	.95	....	.94	1.01	....	.95	.95	1.01
28-28.9	.97	.97	.96	1.03	....	.97	.97	1.03
29-29.9	.99	.99	.98	1.05	....	.99	.99	1.05
30-30.9	1.01	1.01	1.00	1.07	....	1.01	1.01	1.07
31-31.9	1.03	1.03	1.02	1.09	....	1.03	1.03	1.09
32-32.9	1.05	1.05	1.04	1.11	....	1.05	1.05	1.11
33-33.9	1.07	1.07	1.06	1.13	....	1.07	1.07	1.13
34-34.9	1.09	1.09	1.08	1.15	....	1.09	1.09	1.15
35-35.9	1.11	1.11	1.10	1.17	....	1.11	1.11	1.17
36-36.9	1.13	1.13	1.12	1.19	....	1.13	1.13	1.19
37-37.9	1.15	1.15	1.14	1.21	....	1.15	1.15	1.21
38-38.9	1.17	1.17	1.16	1.23	....	1.17	1.17	1.23
39-39.9	1.19	1.19	1.18	1.25	....	1.19	1.19	1.25
40 and above	1.21	1.21	1.20	1.27	....	1.21	1.21	1.27

NORTH TEXAS, WEST CENTRAL TEXAS, EAST CENTRAL TEXAS TABLE EXPLANATION

COLUMN (1) WEST CENTRAL AND NORTH:

Humble Oil & Refining Co., 12-11-41, includes Brown, Callahan, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, and Throckmorton counties.

Panhandle Refining Co., 12-11-41, in Leuders area.

Gulf Refining Co., 12-11-41.

Sinclair Prairie Oil Marketing Co., 12-11-41.

COLUMN (2) NORTH TEXAS:

Continental Oil Co., 12-11-41.
Magnolia Petroleum Co., 12-11-41.
Panhandle Refining Co., 12-11-41.
Bell Oil & Gas Co., 12-11-41.
Texas Co., 12-11-41.

COLUMN (3) EAST CENTRAL:

Magnolia Petroleum Co., 5-21-41, includes Cass, Panola, and Rodessa (Texas and Louisiana), and Miller County, Arkansas.

Gulf Refining Co., 5-21-41, includes Rodessa, Texas.

COLUMN (4) EAST CENTRAL:

Humble Oil & Refining Co., 5-21-41, includes Anderson, Cherokee, Limestone, and Navarro counties and the Navarro Crossing field.

COLUMN (5) EAST CENTRAL:

Humble Oil & Refining Co., 5-21-41, includes Hawkins field.

COLUMN (6) NORTH TEXAS:

Stanolind Oil Purchasing Co., 12-11-41.

COLUMN (7) FISHER COUNTY:

Shell Oil Co., Inc., 12-11-41.

COLUMN (8) MEXIA:

Sinclair Prairie Oil Marketing Co., 5-30-41.

TEXAS FLAT-PRICE FIELDS

Agua Dulce (light), Benavides, Longhorn, Southland, and Sweden, 5-21-41 ..... $1.35

(Continued on Page 103)

STANDARD OIL CO. OF CALIFORNIA

CRUDE-OIL PRICES EFFECTIVE MAY 23, 1941

(All gravities above those quoted take highest price offered in that field)

Gravity	Signal Hill (Long Beach)	Wilmington	El Segundo	Seal Beach	Huntington Beach	Inglewood	Playa Del Rey	Olinda-Brea Canyon	Athens-Rosecrans	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	Greeley, Canal, Wasco	Coles Levee	Mountain View	Elk Hills, Buena Vista Hills, Midway-Sunset, Lakeview area	Lost Hills	Coalinga	Wheeler Ridge	Kettleman Hills	Elwood Terrace
14-14.9	....	$.68	....	....	$.71	....	....	$.70	....	$.70	$.70	$.70	$.72	....	....	....	....	....	$.73	$.73	$.73	....	....	....
15-15.9	....	.71	....	....	.75	$.76	....	.72	....	.72	.71	.72	.72	....	....	....	....	....	.73	.73	.73	....	....	....
16-16.9	....	.74	$.79	....	.79	.79	....	.75	....	.74	.73	.75	.72	....	....	....	....	....	.73	.73	.73	....	....	....
17-17.9	....	.78	.82	....	.82	.82	....	.78	....	.77	.76	.78	.72	....	....	....	....	....	.75	.78	.73	....	....	....
18-18.9	$.80	.82	.86	....	.86	.85	....	.81	....	.80	.79	.82	.74	....	....	....	....	....	.78	.81	.73	....	....	....
19-19.9	.84	.86	.90	....	.89	.88	....	.85	....	.83	.82	.85	.77	....	....	....	....	$.73	.81	.84	.75	....	....	....
20-20.9	.88	.90	.94	....	.93	.92	$.80	.88	....	.86	.85	.89	.80	....	....	....	....	.76	.85	.87	.77	....	....	....
21-21.9	.92	.94	.98	....	.96	.95	.84	.91	....	.89	.89	.92	.84	....	....	....	....	.79	.90	.90	.80	....	....	....
22-22.9	.96	.98	1.02	$.88	.99	.98	.87	.95	....	.93	.93	.96	.87	....	....	....	....	.83	.94	.93	.83	$.76	....	....
23-23.9	1.00	1.02	1.05	.92	1.02	1.01	....	.98	....	.97	.98	1.00	.91	....	....	....	....	.87	.99	.96	.86	.80	....	....
24-24.9	1.03	1.06	1.07	.97	1.05	1.04	f.o.b.	1.01	....	1.01	1.02	1.03	.94	$.99	....	....	....	.90	1.03	.99	.89	.83	....	....
25-25.9	1.07	1.09	1.10	1.01	1.08	1.07	our	1.04	....	1.05	1.06	1.07	.98	1.02	....	....	....	.94	1.07	1.01	.92	....	....	....
26-26.9	1.11	1.12	1.12	1.06	1.11	1.10	pipe	1.08	....	1.09	1.10	1.11	1.01	1.06	....	....	....	.97	1.11	1.04	.95	....	....	....
27-27.9	1.15	1.15	1.15	1.10	1.14	1.14	line	1.11	....	1.13	....	1.15	1.05	1.10	$1.04	....	....	1.01	1.15	1.07	.98	....	....	....
28-28.9	1.18	1.18	1.18	1.15	1.17	1.17	....	1.14	....	1.17	....	....	1.08	1.13	1.08	....	....	1.04	1.19	1.10	1.00	....	....	....
29-29.9	1.20	1.21	....	1.19	1.20	1.20	....	....	$1.17	....	....	....	1.12	1.17	1.12	....	....	1.07	1.24	1.13	1.02	....	....	....
30-30.9	1.23	1.24	....	....	1.23	1.22	....	....	1.21	....	....	....	1.15	1.21	1.15	$1.01	$1.09	1.10	1.28	1.16	1.04	....	....	f.o.b.
31-31.9	....	....	....	....	....	1.24	....	....	1.25	....	....	....	1.19	1.24	1.19	1.04	1.12	1.14	....	....	1.06	....	....	ship
32-32.9	....	....	....	....	....	....	....	....	1.29	....	....	....	1.23	1.28	1.23	1.07	1.14	1.17	....	....	1.09	....	....	....
33-33.9	....	....	....	....	....	....	....	....	1.32	....	....	....	1.27	....	1.26	1.10	1.17	....	....	....	1.11	....	....	$1.22
34-34.9	....	....	....	....	....	....	....	....	1.36	....	....	....	1.31	....	1.30	1.13	1.20	....	....	....	1.13	....	....	1.25
35-35.9	....	....	....	....	....	....	....	....	....	....	....	....	1.35	....	....	1.16	1.22	....	....	....	....	....	$1.23	1.28
36-36.9	....	....	....	....	....	....	....	....	....	....	....	....	1.39	....	....	1.19	1.25	....	....	....	....	....	1.26	....
37-37.9	....	....	....	....	....	....	....	....	....	....	....	....	1.43	....	....	1.22	....	....	....	....	....	....	1.29	....
38-38.9	....	....	....	....	....	....	....	....	....	....	....	....	1.47	....	....	1.25	....	....	....	....	....	....	....	....
39-39.9	....	....	....	....	....	....	....	....	....	....	....	....	1.51	....	....	....	....	....	....	....	....	....	....	....
40-40.9	....	....	....	....	....	....	....	....	....	....	....	....	1.53	....	....	....	....	....	....	....	....	....	....	....

Standard posts 73 cents for all grades at Newhall, Kern River, Kern Front, McKittrick and Round Mountain.

Personal Paragraphs

COL. T. H. BARTON, president Lion Oil Refining Co., El Dorado, Ark., was honored by the Arkansas Junior Chamber of Commerce recently, when delegates throughout the state acclaimed him "Arkansas' Outstanding Citizen" for the year 1941, in recognition of his work in furthering the industrial development of the state.

ED C. PFENNING, manager, Gas Service Co., at Hutchinson, Kans., has been reelected treasurer of the Hutchinson Rotary Club.

LT. J. H. ADAMSON, former chief geologist for Illinois Producing Co., is now stationed at Fort Sill, Okla.

M. A. ROSE, geologist, U.S.G.S., addressed the Houston Geological Society at its weekly meeting last Thursday.

E. V. FORAN of Foran, Boatwright & Knode, consulting engineers in Houston, Tex., received a commission in the U. S. Navy and is now in active service.

DONALD BURTON, JR., land man for Ohio Oil Co., is back in Oklahoma City after covering most of northern Louisiana and other points for several months.

P. F. BROWN, vice president of Honolulu Oil Corp. in charge of West Texas operations, has been elected a member of the board of directors of the firm.

MAJ. T. J. STRICKLER, vice president and general manager of the Kansas City Gas Co., was reelected a member of the United States Chamber of Commerce at the annual meeting of the chamber.

H. C. COCKBURN, Houston, Tex., has announced the sale of most of his property in the Dyersdale pool north of Houston, to FRANK J. GRAVIS, San Antonio, Tex., oil man, for $700,000 cash and a one-eighth overriding royalty.

R. C. KERR, geologist for the California Co., addressed a joint meeting of the A.P.I., Michigan Geological Society, and Michigan Oil Scouts Association at Mount Pleasant, Mich., recently. Mr. Kerr, who spent several years in Arabia, recited how low-pressure tires, radio and air-conditioning have played an important role in making Arabian oil development possible.

DR. C. M. LARSON, of Sinclair Refining Co., spoke on aviation oils at a joint meeting of the departments of Manufacture and Standards and Tests of the National Petroleum Association in Bradford, Pa., June 2.

JOHN TERRELL, formerly geologist at Amarillo, Tex., for Gulf Oil Corp., and recently consulting geologist in Midland, Tex., is now Major Terrell of the Army Ferry Command, stationed somewhere in Florida.

O. Q. LOMAX has been elected vice president and general superintendent of Humble Pipe Line Co., Houston, Tex., to succeed J. A. NEATH, who recently resigned to accept a position with Humble Oil & Refining Co. as director. F. D. McMAHON, formerly division superintendent at Longview, Tex., has been transferred to Houston and made assistant general superintendent; H. M. STEVENSON, formerly chief engineer, has been made chief engineer and assistant to general superintendent at Houston; G. A. LEE, formerly assistant division superintendent in West Texas, has been transferred to Longview and made division superintendent of East Texas; JACK JONES, formerly district superintendent at Odessa of the West Texas division, has been transferred to Midland as assistant division superintendent of the West Texas and Panhandle division; A. J. MULLER, formerly district superintendent at Pampa of the Panhandle area, has been transferred to Odessa and made district superintendent at Odessa, West Texas area; H. V. McCORKLE, formerly division warehouseman and relief district superintendent in West Texas, has been transferred to Pampa, Panhandle area, as district superintendent.

Do You Remember?

From The Oil and Gas Journal Files

40 YEARS AGO

Competition has grown very keen in well drilling and several of the "boom" contractors who made big money on the first wells near Beaumont have quit the field. The average contract cost of a well on Spindletop today is under $5,000.

Capt. A. S. Fisher, one of the five original members of the Hogg-Swayne Syndicate, is making an active canvass for the Democratic nomination for judge of the Court of Appeals in his home district.

Heywood Brothers have just closed a lease on the most promising piece of property at Anse La Butte, Louisiana, and are already preparing to sink a well. It is predicted that Anse La Butte will rival Spindletop in production.

25 YEARS AGO

El Dorado, Kans., is trying to raise funds for the construction of a modern hotel. To date the oil fraternity has donated more than two-thirds of the money.

It is confidently expected that the Oklahoma oil men who are going to the front will drill through the Hindenburg line in short order.

Pierce Oil Corp. is using machines to dig the trenches for its Healdton-Fort Worth pipe line and is also using electric trucks to transport the pipe from the railroad to the line.

15 YEARS AGO

Sinclair Oil & Gas Co. has started construction work on another natural-gasoline plant of the oil absorption type in the Seminole field of Oklahoma. The new plant will be 2 miles south of the firm's present plant.

Vickers Petroleum Co., Wichita, Kans., has applied for refinery membership in the Independent Oil Men's Association.

The gasoline tax collections in Texas for April, the first month of the 3-cent tax, amounted to $1,340,000 compared with $392,466 for April in 1926 when the tax was 1 cent.

CAPT. RUSSELL C. MORRISON, former Albion, Ill., operator, is stationed at Scott Field, Ill.

GEORGE E. BURGHER, president Bur-Kan Petroleum Co., is now making his headquarters at Mattoon, Ill.

W. H. STUEVE, engineer for Oklahoma Gas & Electric Co., Oklahoma City, Okla., has been elected president of the Oklahoma City Engineering Club.

MAJ. JOHN F. HARDY, engineer with Benedum & Trees at Pittsburgh, Pa., has been recalled to active duty with the Air Corps and will be based with the Interceptor Command, Orlando, Fla. Major Hardy was a former pilot.

ROBERT McGREGOR, of the International Petroleum Co. staff at Talara, Peru, is improving after a serious operation in a New York City hospital. He came to New York by way of an emergency airplane flight from Peru.

ERNEST J. SNEED, assistant production foreman in Lone Star Gas Co.'s Eastland, Tex., production district, has been appointed district production foreman to succeed HERMAN C. KELLEY, and has in turn been succeeded by GEORGE E. GROSECLOSE.

REESE H. TAYLOR, president of Union Oil Co., has been granted a leave of absence and has accepted a government post at the request of DONALD M. NELSON. Mr. Taylor will succeed C. E. ADAMS, president of New York Air Reduction Co., as chief of the WPB division of iron and steel. W. L. STEWART, JR., vice president of Union Oil Co., has been elected executive vice president and will serve as the executive officer during the absence of Mr. Taylor.

COL. J. FRANK DRAKE, president of Gulf Oil Corp., Pittsburgh, Pa., is making a tour of the company's holding in the Gulf Coast district.

HARVEY E. HOOK, a chemist in Shell Oil Co., Inc.'s Wilmington, Calif., refinery, has been appointed junior technologist in the technical department of the same refinery.

PAUL (POP) FAHLE, formerly geologist for the Pilgrim Exploration Co., Houston, Tex., is now associated with the Pure Oil Co. as geologist, with headquarters at New Orleans, La.

JOHN P. MANSFIELD, Oil City, Pa., foreman in the Strong field of Pennsylvania for United Natural Gas Co., retired May 15 after completing 45 years of service with the company. He was the oldest employe in point of service.

FLOYD PRATT, assistant to E. C. HEINZ, district sales manager for Tide Water Associated Oil Co. in the Los Angeles, Calif., district, has been appointed assistant manager of white-oil sales and will maintain headquarters at the home office in San Francisco, Calif.

CARL DUNLAP, formerly draftsman for Hagy, Harrington & Marsh, at Amarillo, Tex., has accepted a similar position with Hycar Chemical Co., and has moved to Bartlesville, Okla., headquarters of the company.

D. A. HULCY, president, Lone Star Gas Co., and R. G. SOPER, president, Dallas Gas Co., Dallas, Tex., will serve on the Civilian Defense Council's subcommittee on public utility preparedness which will guard against sabotage.

Alma Mater Honors

Temple W. Tutwiler, chief engineer for Cities Service Oil Co. and director of its oil and natural-gas operations, was awarded the degree of doctor of laws at the University of Alabama, his alma mater, at Tuscaloosa, Saturday, May 23.

TEMPLE W. TUTWILER

Mr. Tutwiler's long career in the steel and iron business both here and abroad prepared him for his present task of assisting W. Alton Jones, president of Cities Service Oil Co., in carrying out that company's large-scale program in the war effort. He has been active in the planning and direction of new facilities for the manufacture of synthetic rubber, aviation gasoline, toluene, ammonium picrate, and other essential war materials which his company is producing.

Following his schooling in Birmingham and at the university, Mr. Tutwiler went immediately into his father's coal and iron company in Birmingham. He continued with various companies in the same business until 1911, when he left an important executive position with the United States Steel Co. to take charge of the construction of the first steel plant in India. He managed this property until 1925, when he returned to America. For some years he directed his various private interests, then joined Cities Service Oil Co., first as a director. Later, at Mr. Jones' request, he took charge of the company's oil and natural-gas activities.

Mr. Tutwiler has long been interested in the affairs of the University of Alabama, having served as trustee.

JACK TORBERT, of Wyandotte County Gas Co., has been reelected to the board of directors of the Kansas City (Kans.) Chamber of Commerce.

Two independent operators have moved to Fort Worth, Tex., in recent weeks—MAE BELCHER, from Dallas, Tex., and HENRY ZACHARY, from Colorado City, Tex.

ARNOLD D. BENNISON, who entered the employ of General Petroleum Corp. in 1919 as a chemist, has been appointed manager of the oil supply and exchange department of the company.

H. D. DICKSON, division civil engineer of Humble Oil & Refining Co., at Midland, Tex., has been transferred to Houston, Tex. He and his family left Saturday for their new home.

After receiving his commission, EDWARD G. OMOHUNDRO, assistant district manager for the Humble Oil & Refining Co., at Abilene, Tex., has been ordered to report to the West Coast air force training center at Santa Ana, Calif. He formerly was stationed at Galveston, Tex., and at San Antonio, Tex.

A. L. WEIL, who resigned recently as general chairman of District 5, is now hard at work defending the various Kettleman North Dome operators who are being sued by the Department of Interior for failure to pay what the department considers should be paid for crude oil and natural gas. The department does not agree with the posted price of marketing companies and is suing for more money on past royalties. No previous precedent has been established as the published price is always the going price except to the Interior Department.

T. F. BIRMINGHAM has been elected chairman of the board of Margay Oil Corp., Tulsa. He was formerly president, in which post he has been succeeded by M. B. SPEARS, J. I. TAYLOR, secretary-treasurer, was named vice president, and E. D. OLDERBURG was made secretary-treasurer.

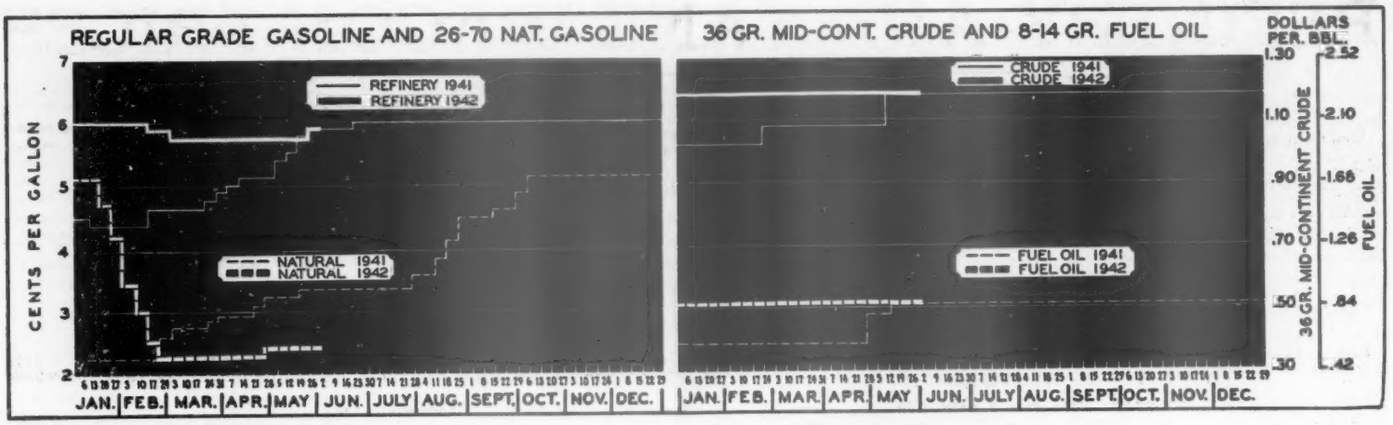
JOHN R. BURKE, Tulsa, who is retiring from Atlantic Refining Co. after a service of 24 years, was one of three men who made up the organization in the Oklahoma-Kansas division after the producing company was formed. He has seen the producing company in Oklahoma and Kansas grow from this organization to a major unit.

Shifts: C. S. DICKENS, engineer, Magnolia Petroleum Co., Corsicana, Tex., to Ardmore, Okla.; A. M. SCHAIBLE, engineer, Gulf Oil Corp., Fairview, Kans., to Port Arthur, Tex.; C. C. STEWARD, engineer, Bechtel-McCone-Parsons Corp., Louisiana, Mo., to Whittier, Calif.; T. M. OCHELTREE, JR., engineer, Shell Oil Co., Inc., Midland, Tex., to Erie, Pa.; ROBERT S. SHIRKLIFF, engineer, Standard Oil Development Co., Elizabeth, N. J., to Robinson, Ill.; H. C. GRIFFIN, superintendent, Mid-Union Drilling Co., Wichita Falls, to Houston, Tex.; L. O. WARD, superintendent, M. J. Delaney Co., Abilene, to Tyler, Tex.; J. M. BOXELL, engineer, Phillips Petroleum Co., Webb City, to Bartlesville, Okla.; FRANK H. MUELLER, Mueller Co., Decatur, Ill., to Defiance, Ohio; H. C. DEARBORN, engineer, Texas Co., Carbondale, Ill., to Summit, N. J.; GONZALO ACOSTA, engineer, Texas Co., Fort Worth, Tex., to Bogota, Colombia; J. P. GARNER, engineer, Texas Co., Dodge City, Kans., to Lusk, Wyo.; C. G. ADAMS, geologist, Texas Co., Dodge City, Kans., to Lusk, Wyo.; R. M. BRACKBILL, engineer, Shell Oil Co., Inc., Rolla, Mo., to McLeansboro, Ill.; DONALD E. EDSTROM, geologist, Sinclair Prairie Oil Co., Nocona, Tex., to Ardmore, Okla.; LEO I. MULLANEY, engineer, Texas-Empire Pipe Line Co., Pana to Coal City, Ill.; E. L. McINTYRE, superintendent, Pure Oil Co., Kiefer to Pauls Valley, Okla.; J. GEORGE KLEIN, geologist, Continental Oil Co., Ponca City, Okla., to Great Bend, Kans.; K. M. LAWRENCE, geologist, Amerada Petroleum Corp., Woodward, Okla., to Crawford, Neb.; RALPH D. CURTIS, engineer, Barnsdall Oil Co., Tulsa, to Wichita, Kans.; M. H. FULLER, superintendent, Lockhart Oil Co., Alice to Banquete, Tex.; VAL T. BILLUPS, land department, Shell Oil Co., Inc., Centralia, Ill., to Tyler, Tex.; C. J. GOLDSTON, superintendent, Shell Oil Co., Inc., Pampa, Tex.; to Dillard, Okla.; F. D. LOCKARD, engineer, Panhandle Eastern Pipe Line Co. to Fortieth Ordnance Company, Aberdeen Proving Ground, Maryland.

J. HOWARD WADDLE, division engineer for the Arkansas Oil and Gas Commission at Magnolia, Ark., resigned last week, effective June 15, to become engineer in charge of construction and operation of the McKamie Gas Cleaning Co.'s gas-purification plant. J. W. SANDERS and EMON CLARK, engineers formerly on the Arkansas commission staff, have entered armed service, the former as a lieutenant and the latter as a private.

GLENN S. DILLE, independent geologist, has been elected president of the Tulsa Geological Society. Other officers elected at the annual meeting last week are: MAURICE R. TIES, Ohio Oil Co., first vice president; MYRON C. KEISS, Pure Oil Co., second vice president; LOUIS DESJARDINS, Seismograph Service Co., secretary-treasurer; CONSTANCE LEATHEROCK, Tide Water Oil Co., editor.

DON MILLER, Phillips Petroleum Co., Bartlesville, Okla., has been elected chairman of the Central Oklahoma chapter, American Petroleum Institute, which has been organized in Oklahoma City. Three vice chairmen are WESLEY MOORE, of British American Oil Producing Co.; BUD HARDER, of Cities Service Oil Co., and ED STEWART, of Ohio Oil Co. R. F. SCHOOLING, of British American, is secretary-treasurer.



MARKET DEVELOPMENTS . . .

East Coast

NEW YORK.—Many retail outlets in District 1 had exhausted their May gasoline quotas before the Decoration Day holiday as a result of the 50 per cent restriction on deliveries which had gone into effect earlier in the month. Since trucks, other commercial vehicles and other consuming units which are exempt from restrictive orders had difficulty in obtaining gasoline, this condition was taken as an indication that further restrictions would be applied to nonessential consumers or that a revised distribution system would be adopted. Under the latter, a greater proportion of supplies would be distributed among stations serving commercial and other essential consumers predominantly.

Exhaustion of supplies was also blamed in part on dealers who refused to abide by rationing regulations and allowed purchasers to obtain more gasoline than permitted according to their cards. Many reports of such violations were heard, particularly in the suburban New York area, and steps were taken in some instances by the OPA to bring noncooperative dealers into line.

The prediction made 6 weeks ago by Dr. John Frey, OPC director of marketing, that excess supplies of gasoline and fuel oil in the western Pennsylvania area would soon be disposed of has been borne out. Increased shipments into the so-called shortage area have depleted both gasoline and fuel-oil stocks to the point where both products are currently reported tight. A month ago western Pennsylvania region refiners had close to 500,000 bbl. of 65-octane or better gasoline in storage against approximately 420,000 bbl. a year earlier.

Mid-Continent

ADVANCES of 0.125 cent per gallon quoted late last week to spot-market buyers of refinery gasoline in the Mid-Continent appeared to be generally supported by the industry and met comparatively slight resistance from purchasers.

Tone of the Mid-Continent motor-fuel market has been firming for several weeks. Substantial movement from interior plants to the East Coast has developed in the gradual increase of overland shipments and demand in the Middle West is increasing despite a general tendency of drivers to curtail automobile operations. The natural increase of summer driving, although reported at a more moderate rate than in normal years, is still sufficient to raise total motor-fuel demand above the winter and spring requirements. Another factor in market improvement is the modified rate of gasoline production which is a reflection of recommendations from the Office of Petroleum Coordinator that fuel-oil recovery be maintained at rates approximately 20 per cent greater than during the last 6 months of 1941. The change in operating conditions has reduced offerings on the spot market and some buyers are making firm offers to new sources of supply at the higher prices.

Regular motor fuel is now quoted at a range of 5.625 to 5.75 cents per gallon but the prices are still fractionally under the ceilings established by the Office of Price Administration in order No. 88.

Mid-Continent refiners have increased shipments to the East Coast as a result of purchasers in District 1 attempting to procure supplies for overland delivery from the nearest available sources.

SENTENCE SUMMARIES

MID-CONTINENT: Refinery gasoline prices increased 0.125 cent per gallon and appeared well supported at the higher level.

GULF COAST: Open-market sales limited to small quantities for rail and truck shipment. Lend-lease business sporadic.

EAST COAST: Overland transportation increasing but fails to equal minimum requirements.

PENNSYLVANIA: Western refinery district liquidates gasoline stocks by shipments into the rationed area. Other products firm.

PACIFIC COAST: Attack launched on dilution of quality motor fuels which may clear up distress prices.

A.P.I. REFINERY REPORT

Week Ended May 23, 1942

(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks Gasoline	Residual	Gas oil
Appalachian	152	3,623	595	472
Ind., Ill., Ky.	712	19,963	3,225	2,799
Okla., Kans., Mo.	361	9,184	1,578	952
Censored group*	1,457	44,468	16,625	14,464
Rockies	92	2,473	559	329
California	619	17,323	56,860	11,598
Total May 23, 1942	3,393	97,034	79,442	30,614
Total May 16, 1942	3,484	99,134	78,826	30,206
Total May 24, 1941	3,922	94,141	92,092	34,906

Note: Refinery runs and stocks for week ended May 30, 1942, appear on Trends page.

*Reports combined on East Coast, Texas Gulf, Louisiana-Arkansas and Inland Texas at request of OPC.

CRUDE-OIL STOCKS

(Bureau of Mines estimate)

Week ended:	Bbl. of crude*
May 23, 1942	253,423,000
May 16, 1942	254,202,000
May 24, 1941	261,576,000

*Excludes heavy, unrefinable stocks in California.

Transportation problems in the Mid-Continent may become more acute in the near future as a result of efforts to divert 30 per cent of the tank cars remaining in Middle West service to the delivery of products to District 1. Most of the 45,000 tank cars diverted to East Coast service since coastwise tanker movement was disrupted have been withdrawn from the Middle West.

Gulf Coast

HOUSTON, Tex. — Activity in the Gulf Coast market was still limited due to the lack of transportation facilities. Good demand for all major refined products still exists but actual movement is confined to small lots.

There is little information as to how much material is being moved by tank cars, but most observers are of the opinion that the volume has been reduced within recent weeks as more tank cars continued to be shifted to refinery centers further inland to take advantage of shorter hauls to the East Coast. Barge movement is said to have been increased but this has not been in sufficient volume to take up the loss in tank cars.

Pacific Coast

LOS ANGELES, Calif.—The general Pacific Coast market is quiet as consolidation of several independent refiners has reduced spot sales.

Wilshire Oil Co. and Eagle Oil & Refining Co. are concentrating operations on production of aviation gasoline and have subordinated regular motor fuel to secondary importance. This reflects decreased sales of motor fuel in independent service stations some of which report reductions of 30 to 40 per cent. Many independent stations are just hanging on and have little hope that conditions can improve in the near future. Some have secured reduced rent and others not so fortunate will be obliged to close.

Wilshire is already moving in equipment necessary in the production of aviation gasoline but it will be several months before the new unit goes on stream.

Threatened action by the Los Angeles city attorney to stop the use of inferior gasoline blended with and sold under trademarks of premium fuels may clear up some of the distress selling. Severe penalties are threatened against those holding such gasoline unless they have sales slips showing from whom the gasoline was purchased and in this case the supplier may be prosecuted.

While checking into the octane number of certain gasolines the state Bureau of Weights and Measures will undoubtedly check several distress gasolines to determine if they meet minimum specifications below which it is illegal to sell gasoline in California.

REFINERY AND TANK-WAGON PRICES

(Prices as of June 2)

Refinery Gasoline

Octane (A.S.T.M.):	†80	78	74-76	72-74	68-70	63-66	60 & lower
Mid-Continent*				5.625-5.750		5.250-5.375	4.875-5.000
Pennsylvania			6.750-7.000				
Gulf Coast‡	6.00-6.50			§5.750-6.250	§5.750-6.250	§5.250-5.750	§5.000-5.500
Northeast Coast	9.700			9.200	9.200		
Pacific Coast		6.500-6.750	6.125-6.250	6.250-6.500	5.750-6.250	5.25-5.50	4.75-5.00

*Basis Group 3. †1939 C.F.R. (research method). ‡Integrated companies restricted to lowest prices. §Unleaded.

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.

Natural Gasoline

Grades:	26-70	18-55	75-85(350-375)
Oklahoma (Group 3)	2.375	2.750-2.875	
North Texas	2.000	2.375-2.500	
North Louisiana	2.125	2.500-2.625	
California			5.000-5.500

Kerosene and No. 1 Fuel Oil

Gravity:	46	45	42-44	41-43	38-40
Mid-Continent*			4.500-4.750	4.375-4.625	
North Louisiana				4.500-4.750	
Pennsylvania	6.250	6.125-6.250			
California				4.500-6.000	4.500
Northeast Coast				5.700	
Gulf Coast				3.875	

*Basis Oklahoma Group 3.

Tractor, Diesel, and Bunker Fuel Oil

Specifications:	46-48° G.	24 D.I.	48-52 D.I.	58 & above	Diesel bunkers	Bunker C
Mid-Continent*	4.125					
California		2.750-4.000			‡$1.35-1.45	$0.85-0.90
Gulf Coast			4.000	4.125	1.45	0.85
Northeast Coast				5.800	2.222	1.80
North Louisiana						†0.80-0.85

*Basis Oklahoma Group 3. †10-14° gravity. ‡Pacific Specification 200.

Furnace Oil, Gas Oil, Fuel Oil

	No. 2	No. 3	No. 5	No. 6
Mid-Continent*	3.500-3.625	3.375-3.500	$0.85	$0.85
Pennsylvania (West)	5.625-5.875	5.375-5.875	†5.250-5.500	
Northeast Coast	5.8	5.8	1.85	1.80
Pacific Coast	5.5	5.5	‡0.80-95	§0.80
Gulf Coast	3.875-4.0		1.65	0.85

*Basis Oklahoma Group 3. †36-40 gravity fuel oil. ‡Pacific Specification 300. §Pacific Specification 400.

Lubricating Oils

Bright and Steam Refined

OKLAHOMA (Group 3)—

200 210 D, 10-25	27.00
150 160 D, 0-10	23.00
120-125 D, 0-10	22.00
Steam refined:	
600 dark green (untreated)	9.00 9.50

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):	
10 pour point	30.50
15 pour point	29.50
25 pour point	25.00 28.00
Steam refined:	
600	15.00 16.00
650	15.50 16.50
600 flash	16.00 17.50
650 flash	17.00 17.50

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

0-10 pour point:	
500-3	15.00
600-3	18.00
500-3	19.50
600-3	20.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

Wax

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	4.350-4.550
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	4.250
124-126 (A.m.p.) w.c. scale	4.250

Neutral Oil

CALIFORNIA—

Pale oils:		
200-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25

GULF COAST—

Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	12.25	12.50

PENNSYLVANIA—

150 vis. at 70° F., 3 color, 400-405 flash:	
Zero pour point	38.50
10 pour point	37.50
15 pour point	36.50
25 pour point	31.00
200 vis., at 70° F., 3 color:	
Zero pour point	40.50
10 pour point	39.50
15 pour point	38.50
25 pour point	33.00

NEW YORK—

Wax in bags fully refined:	
130-132 (A.m.p.) wax	6.250
133-135 (A.m.p.) wax	6.550
Crude scale:	
124-126 (A.m.p) w.s.	4.350-4.455
124-126 (A.m.p.) y.s.	4.350-4.455

EXPORT PRICES

Gasoline—60-62° Gravity, Maximum 400 End Point

Octane:	72-74	68-70	65-66	60
Gulf Coast	6.500	6.250-6.500	5.875	5.625
Pacific Coast		6.125-6.500	5.875-6.000	5.500-5.625

Distillate and Fuel Oil

	Kerosene 41-43	Diesel fuel 24 G.	Diesel fuel 48-52 D.I.	Diesel fuel 58 D.I.	Diesel fuel Bunkers	Bunker C grade
Gulf Coast	4.000-4.250		4.125-4.375	4.375	$1.65-80	$0.85-95
Pacific Coast	4.750-5.000	1.25-30			†1.35-45	*0.80-90

*Pacific Specification 400. †Pacific Specification 200.

Lubricating Oils

	Neutral oils 200-3	Neutral oils 150-3	Bright and cylinder stocks 200-3	Bright and cylinder stocks 150-3	Bright and cylinder stocks 600&630 S.R.
Mid-Continent	16.8		28.8	24.8	
Pennsylvania	43-50	41-46	36-37	36-37	26.5-27

GASOLINE AND KEROSENE TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades, tax included, undivided dealer)

ATLANTIC AND NEW ENGLAND

(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kero-tank wag.
Baltimore, Md.	15.05	5.50	9.10
Boston, Mass.	14.50	4.50	8.40
Burlington, Vt.	16.50	5.50	...
Buffalo, N. Y.	15.80	5.50	9.20
Dover, Del.	16.30	5.50	10.80
Hartford, Conn.	15.20	4.50	...
Manchester, N. H.	16.90	5.50	9.40
Newark, N. J.	14.30	4.50	8.30
New York, N. Y.	15.70	5.50	8.40
Philadelphia, Pa.	15.80	5.50	10.55
Pittsburgh, Pa.	16.30	5.50	10.90
Portland, Me.	15.90	5.50	8.50
Providence, R. I.	14.60	4.50	8.20
Washington, D. C.	14.30	3.50	9.60
Average 14 cities	15.51	5.07	9.28

(All prices undivided dealer basis.)

CENTRAL

(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co. and Texas Co.)

	Dealer tank wagon	Combined tax	Kero-tank wag.
Chicago, Ill	14.10	4.50	10.30
Cleveland, Ohio	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	11.90	4.50	9.80
Detroit, Mich.	14.40	4.50	9.60
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind.	15.20	5.50	9.80
Little Rock, Ark.	17.50	8.00	10.00
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	16.50	7.00	8.50
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	15.03	5.57	9.61

*Includes 1-cent state tax.

SOUTHEASTERN

(Standard Oil Companies of New Jersey, Kentucky and Louisiana)

	Dealer tank wagon	Combined tax	Kero-tank wag.
Atlanta, Ga.	19.00	7.50	9.40
Birmingham, Ala.	19.60	8.50	9.00
Charleston, S. C.	18.55	7.50	...
Charleston, W. Va.	18.85	6.50	11.90
Charlotte, N. C.	19.70	7.50	9.90
Jacksonville, Fla.	19.00	8.50	8.40
Jackson, Miss.	18.00	7.50	8.50
Louisville, Ky.	17.00	6.50	8.50
Memphis, Tenn	17.75	8.50	10.50
New Orleans, La.	17.25	8.50	*10.00
Norfolk, Va.	17.05	6.50	10.80
Average 11 cities	18.34	7.50	9.67

*Includes 1-cent state tax.

MIDWESTERN

(Continental Oil Co.)

	Dealer tank wagon	Combined tax	Kero-tank wag.
Albuquerque, N. M.	17.50	7.50	10.00
Boise, Idaho	20.10	6.50	10.80
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.80
Reno, Nev.	17.50	5.50	13.80
Salt Lake, Utah	18.50	6.50	14.80
Average 8 cities	17.58	6.25	12.88

PACIFIC COAST

(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kero-tank wag.
Portland, Ore.	17.00	6.50	13.50
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	6.50	13.50
Average 3 cities	16.17	5.83	12.83
Average 50 cities	16.53	5.96	10.30
Average last week	16.57	5.96	10.30

Crude-Oil Prices

(Continued from Page 99)

Agua Dulce (heavy), 10-16-41 ... $1.25
Republic Oil Refining Co., 5-21-41.

Alfred and Magnolia City ... $1.35
Continental Oil Co., 5-21-41.

Alice, Benavides (North Sweden), Ben Bolt, Clark-Mull, Sun, and Tom Graham ... $1.35
Humble Oil & Refining Co., 5-21-41.

Batson (new), Humble (35° and above), Fig Ridge, Hardin, Hull (25° and above), La Belle, North Dayton (25° and above), Seabreeze South China, West Orange, Willow Slough and Oyster Bayou ... $1.25
Sun Oil Co., 5-21-41.

Cass County ... $1.20
Texas Co., 5-21-41.

Cayuga, Anderson County ... $0.90
Pan American Production Co., 5-21-41.

Chapel Hill, Smith County:
Crude distillate ... $1.30
Crude oil ... 1.18
Chapel Hill Gas System, 11-7-41.

Clay Creek, Washington County ... $1.00
Sun Oil Co., 5-21-41.

Cleveland, Liberty County ... $1.26
Magnolia Petroleum Co., 5-21-41.

Conroe, Montgomery County ... $1.43
Humble Oil & Refining Co., 5-21-41.
Tide Water Associated Oil Co., 5-21-41.
Sun Oil Co., 5-21-41.
Texas Co., 5-21-41.

Cotton Lake (South) ... $1.35
Sun Oil Co., 5-21-41:

East Texas and Flag Lake* ... $1.25
**Humble Oil & Refining Co.*, 5-21-41.
Pan American Production Co., 5-21-41.
Tide Water Associated Oil Co., 5-21-41.
Gulf Refining Co., 5-21-41.
Magnolia Petroleum Co., 5-21-41.
Sinclair Prairie Oil Marketing, 5-21-41.
Shell Oil Co., Inc., 5-20-41.
Sun Oil Co., 5-21-41.
Texas Co., 5-21-41.
Stanolind Oil Purchasing Co.

Esperson (35° and above), South Esperson ... $1.30
Sun Oil Co., 5-21-41.

Flour Bluff, East Flour Bluff ... $1.33
Humble Oil & Refining Co., 5-21-41.

Hockley and Cochran ... $0.87
Texas Co., 5-21-41.

Livingston and Mercy ... $1.25
Shell Oil Co., Inc., 5-20-41.

Long Lake ... $1.23
Sinclair Prairie Oil Marketing, 5-21-41.

Luby ... $1.35
American Mineral Spirits Co., 5-21-41.

Luling ... $1.05
Magnolia Petroleum Co., 5-21-41.

Lytton Springs ... $1.17
Magnolia Petroleum Co., 5-21-41.

Salt Flat, North Salt Flat, Darst Creek*, Hilbig, Clark, Carroll, and Zoborski ... $1.14
Humble Oil & Refining Co., 5-21-41.
Magnolia Petroleum Co., 5-21-41.
**Texas Co.*, 5-21-41.

Rincon (North), Sun, North Sun and Garcia ... $1.35
Sun Oil Co., 5-21-41.

Yturria ... $1.45
Sun Oil Co., 3-19-42.

Talco ... $0.79
Humble Oil & Refining Co., 5-21-41.
Magnolia Petroleum Co., 5-21-41.

Tomball and Satsuma ... $1.40
Humble Oil & Refining Co., 5-21-41.
**Magnolia Petroleum Co.*, 5-21-41.
Stanolind Oil Purchasing Co., 4-1-41.

Van, Van Zandt County ... $1.08
Humble Oil & Refining Co., 5-21-41.
Pure Oil Co., 5-21-41.

Yates (regular) ... $0.95
Humble Oil & Refining Co., 5-21-41.
Gulf Refining Co., 5-21-41.
Shell Oil Co., Inc., 5-20-41.

Yates (shallow) ... $0.82
Shell Oil Co., Inc., 5-20-41.

Kentucky

Ashland Oil & Transportation Co., 6-19-41:
Big Sandy River ... $1.38
Kentucky River ... 1.43

Sohio Corp., 5-21-41:
Birk City ... $1.32

Montana

Continental Oil Co., 4-1-41:
Cat Creek ... $1.15

Colorado

Stanolind Oil & Gas Co., 5-20-41:
Iles ... $1.07

Continental Oil Co., 5-21-41:
Canon City-Florence ... $1.05

Canadian Fields

Imperial Oil, Ltd.:
Petrolia, 11-6-39 ... $2.10
Oil Springs, 11-6-39 ... 2.07
Bothwell, 11-6-39 ... 2.10
Turner Valley, 7-16-41 ... $1.35-1.97

EQUIPMENT PROGRESS...

New Taylor Fulscope Time-Schedule Controller

Maintaining exact temperature, pressure, flow, or liquid level according to a predetermined time schedule is the duty of the new Taylor Fulscope time schedule controller. After the ideal processing schedule has once been determined, it is possible, with this new instrument, to automatically and precisely repeat the process as many times as desirable.

The cam and the chart are individually mounted and conveniently located for instant visual comparison on this latest development of the Taylor Instrument Companies, Rochester, N. Y. Completely new, and incorporated with the famous Fluscope controller, the Taylor Fulscope time schedule controller presents friction drive cam assembly which permits rotation of the cam without loosening any locking means; improved means of resetting one cam without disturbing the other in an instrument with two complete control mechanisms; each cam capable of operating from one to four air valves, micro-switches or both for the actuation of any external mechanism such as a valve, bell or light, and do this automatically in any desired relation of one to the other; and the automatic return of the cam to the starting position.

An optional feature of this new controller is the interrupter timer which allows extreme flexibility to both the rise and the holding periods of the process under control. This timing feature allows the use of a very fast cam clock for a rapid rising period, but reduces the speed of the clock to increase the length of the holding period. The rising period, the holding period or both may be increased as much as 6½ times normal period with this timer. It is built right in the time schedule controller, eliminating the need for a separate timing controller.

The new controller is available in all control forms, including automatic reset and pre-act. By the addition of precalibrated assemblies it can easily be converted to fit any process requirements which might arise in the future. Universal case for face or flush mounting.

TRADE LITERATURE

AN-COR-LOX DIVISION, LAMINATED SHIM CO., INC., 86 Union Street, Glenbrook, Conn.—Folder on An-cor-lox lock nuts which is replete with diagrammatic, photographic, and factual matter on An-cor-lox styles, materials, designs, and finishes; application instructions; and suggestions for parts conversion to the An-cor-lox function. Copies of the interesting An-cor-lox folder may be obtained by writing the manufacturer.

BROWN INSTRUMENT CO., Wayne and Roberts Avenue, Philadelphia, Pa.—Revised catalog on Brown potentiometer pyrometers, No. 1105. This catalog presents clear and concise information on the design and operating features of the Brown potentiometer pyrometer and accessory equipment. Temperature measurement by the radiation method is featured with a description and cross-section view of the Brown radiamatic sighting tube. A comprehensive line of installation accessories for practically all applications are illustrated.

GRAVER TANK & MANUFACTURING CO., INC., East Chicago, Ind.—A bulletin (No. 310) on Graver chemical proportioner, a new device providing accu rate control of the feed of chemicals into the water-treating plant in proportion to the volume of water. Equipment insures uniform treatment at all times regardless of volume of water entering treating plant. Permits instant increase or reduction of chemical charge over a wide range should water require change of treatment. Proportioner is readily adapted to any make of solution type chemical feeder where swing pipe or skimmer can be installed in chemical feeder.

Admiral Wat T. Cluberius, U. S. Navy, retired, presenting the Navy "E" emblem to the Harrisburg Steel Corp. The employe in the center was selected to receive the Navy "E" button at the formal presentation. Wilbert Wear, president of the corporation, is congratulating the employe and thanking the Navy's representative

New Combination Tubing Hooks By Byron Jackson Co.

A completely new line of hooks, designed exclusively for the purpose of handling tubing, consists of BJ "75," "50" and "30" tubing hooks, each number

designating the rated capacity of the hook, with a safety factor of four based upon the ultimate strength of the material. They are the product of Byron Jackson Co., Oil Tool Division, Houston, Tex.

Both the 50-ton and 75-ton hooks are of the "combination" design described below. The 30-ton hook is made with a single-hook body and is furnished with a swivel lock. It is not equipped with relief springs, a heavy-duty ball bearing being sufficient to carry the loads imposed upon it.

In both of the larger hooks, by removing only the shank pin, the body can be changed readily from the single-hook type to the duplex (two-hook) type. BJ weldless links are thus permitted to hang vertically so that the elevator is easily opened or closed, and a uniform load distribution is secured. The two larger hooks are equipped with an enclosed, low-stressed relief spring, having a 5-in. travel, which is strong enough to lift a stand of tubing clear of the collar, thus preventing damage to threads and speeding up operations.

For workover or perforation cleaning jobs either side of the duplex hook body can be used to pick up the swivel, and the full rated capacity of the hook is present when used for such purposes. This method is not recommended for continuous drilling operations due to the lost time in operating the locking arms. A straight pull is provided (as illustrated) and the swivel ball is securely locked in safe against accidental "jumping" of the hook, with a heavy, overhanging metal section to take any upward thrust of the swivel ball.

A swivel lock to prevent rotation, and an adapter for direct connection to the block are additional features when specified. All three sizes of these new hooks are shorter in over-all length than the corresponding sizes of previous types—an important feature where overhead clearance is limited in short derricks.

Timken-Detroit Presents Chart On Truck Maintenance

Timken-Detroit Axle Co., Detroit, Mich., announces a new 22-in. by 38-in. wall chart describing axle inspections which should be made at regular intervals in carrying out a well-rounded truck maintenance program. The new wall chart is one of many similar maintenance aids produced by the company in connection with its A. M. (Axle Maintenance) program launched the first of this year.

In addition to covering front axles and the four types of rear-driving axles the company manufactures —bevel, worm, double-reduction, and two-speed double-reduction—the chart also describes inspection operations applying to brakes and transfer cases. All types of equipment covered by the wall chart are illustrated to assure clear understanding of the inspection instructions given.

The new wall chart is attractively printed in two colors and is designed to be hung in offices as well as in shops. The top and bottom edges are reinforced with metal strips, while a metal eyelet is provided at the top to permit hanging the chart in any convenient wall location.

Copies of the wall chart may be secured without charge by addressing the Timken service department at the main plant in Detroit, Mich.

Wall Cards on Care Of Rubber Hose

In the interest of rubber conservation, two useful wall cards on the proper care of hose have been prepared by the Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., Passaic, N. J., and are now ready for distribution. One of the cards is devoted to the proper care of the fire hose and the other lists rules for the proper care of air, water, steam, and other types of rubber hose and for proper attaching of couplings. Both are 8¾ in. by 11 in. and have an eyelet for convenient hanging.

AMONG EQUIPMENT MEN...

R. A. Feemster Appointed Kobe Division Sales Manager

The appointment of R. A. Feemster as Mid-Continent division sales manager in charge of sales and field operating activities has been announced by Kobe, Inc., effective May 1, 1942. Mr. Feemster will continue his headquarters in the company's division offices at Oklahoma City, Okla.

R. A. FEEMSTER

After graduating from the school of petroleum engineering at Oklahoma University in 1932, Mr. Feemster joined the engineering and production department of Phillips Petroleum Co. Later he became associated with development work in oil-field equipment involving subsurface and drilling and completion problems.

In April 1941 he joined Kobe, Inc., as district representative in Oklahoma City and was later made special sales representative—which position he held until his recent appointment to division sales manager.

Los Angeles Nomads Present Awards of Distinguished Service

Holding the regular monthly dinner meeting during National Foreign Trade Week, the Los Angeles chapter of Nomads met at the Mayfair Hotel in Los Angeles, Wednesday, May 20, 1942. A number of interesting guests were present and the attendance was so large that overflow tables had to be set up. The main speaker of the evening was W. S. Rosecrans, president of W. S. Rosecrans, Inc., and a man long connected with various industries of California who has traveled in many countries in the interest of foreign trade. Mr. Rosecrans discussed the vital necessity of international trade after the war and during his address pointed out that intelligent, constructive criticism must be carried on now if the kind of peace we all desire is to result from the present conflict.

Awards of Distinguished Service were presented to the regular Nomad members by Emerson Spear in behalf of the Los Angeles Chamber of Commerce which, during Foreign Trade Week, so honored men who had traveled abroad in the interest of foreign trade. These awards were attractive parchment diplomas suitable for framing.

Preceding the main address the several members of the consular service present from a number of foreign countries were introduced by Bart Gillespie. These were Dr. Adrain Hartog, consul of the Netherlands; Alastair G. Maitland, vice consul for the British Empire; Ernesto A. Romero, vice consul of Mexico; Ismael Aviles, consul of the Dominican Republic; Fernando de Flores, vice consul of Costa Rica, and Carlos Cavalcanti, secretary to the Venezuelan consulate.

The meeting closed with moving pictures in colors shown by George Sutherlen, who took them in Tibet, Nepal, and India during a vacation taken when he was with the California Arabian Standard Oil Co. in Saudi Arabia. Of particular interest was the stark beauty of Mount Everest taken with a telephoto lens.

The foreign oil men present included M. H. Bush, of California Arabian Standard Oil Co., from Saudi Arabia; W. C. Field, who was with the N.P.P.M. in Sumatra; Dirk Kwakernaat, of Caribbean Petroleum Co., Venezuela; H. J. Buddenhagen, of the Shell interests, Maracaibo, Venezuela; Alfonso Cesario Alvim, Luiz Meira de V. Chaves, and Geonisio Carvalho Barroso of the Conselho do Petroleo, Brazil. Other guests were Walter Measday of the U. S. Department of Commerce; Stanley T. Olafson, manager of Department of Foreign Commerce; Los Angeles Chamber of Commerce; Al Hill of the Los Angeles Chamber of Commerce; and Charles J. Hoffman recently returned from Panama.

Mead Joins Universal Exploration

John P. Mead has joined Universal Exploration Co. as vice president and supervisor.

Mr. Mead was formerly with the Superior of California and has been engaged in geophysical exploration work for the past 10 years.

Johnson Named Manager Allis-Chalmers General Sales Organization

William C. Johnson, sales manager of the crushing and cement division, has been named manager of the Allis-Chalmers general sales organization.

Until his election as president, Walter Geist directed the general sales organization, first as general representative and later as vice president.

WILLIAM C. JOHNSON

As general sales manager, Mr. Johnson will direct the sales of 1,600 different products and the operations of 60 district offices.

When Mr. Johnson arrived in Milwaukee, Wis., from Alabama to join the Allis-Chalmers organization in January 1924, he put on his overalls and started to work as a helper on a layout table in the shop. He also spent a short time in the foundry, and then went on an erection job at the Riverside pumping station, Milwaukee.

Back in the shops again after the completion of the pumping station, he went to work on crushing machinery.

He became an expert on new crushing equipment then in the process of development and was sent all over the country to service the equipment. In that capacity he became widely acquainted with the industry.

In 1929 he was made the representative of the crushing and cement division in the Atlanta, Ga., district, which included seven southeastern states. In 1935 he went to Chattanooga, Tenn., in a general sales capacity, and 2 years later he opened up a company district office at Knoxville, Tenn., where he handled contracts with the Tennessee Valley Authority, the aluminum, and phosphate industries. He also went out of the country several times to conduct important sales negotiations.

In March 1940, he returned to Milwaukee as sales manager for the crushing and cement division.

Murray Elevated by American

L. D. MURRAY

L. D. (Jiggs) Murray, for 2 years district manager of the American Iron & Machine Works Co. office in Houston, Tex., has been appointed special sales representative, effective June 1. Prior to his district managership of American Iron's Houston plant, Jiggs was sales manager of the Gulf Coast area for the same company. His new headquarters will be in Dallas, Tex.

COCHRAN ADDRESSES MAY MEETING OF TULSA NOMADS

Earl H. Cochran, of Fred E. Cooper Co., Tulsa, who returned early this month from a 9-month trip to South America and points in Trinidad and Netherlands West Indies, was the principal speaker at the monthly luncheon of the Tulsa Nomads, May 18. Mr. Cochran told of oil conditions in all the principal operating areas in several countries. The monthly luncheons will be discontinued through the summer months, resuming in September. Accompanying picture shows membership and guests attending the May luncheon.

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Texas, New Mexico, Oklahoma, Louisiana and Illinois
20 Years Experience
Inquiries Invited
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Paul Brown Bldg., St. Louis, Mo.

FOR SALE: Oil and gas leases, small production, drilling propositions, fluorspar and rock asphalt deposits. Reports and maps furnished on request. W. P. Harley, Bowling Green, Ky.

CHEAP CRANE COUNTY Sec. 18, B28, under Magnolia-Stanolind leases. Jefferson G. Smith, 215 Littlefield Bldg., Austin, Tex.

FOR SALE: 10 acres Johnston Co., Okla. NW¼ of NW¼ of SE¼, Sec. 19, Twp. 2S, Range 8 East. Barry, 3505 Legation St., NW. Washington, D. C.

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Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press. 215 East Third St., Tulsa. Okla.

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma

WE BUY & SELL all types of Oil and Gas Royalties. Sales restricted to registered dealers only. Grimes Royalty Co., National Mutual Bldg., Tulsa Okla

FOR SALE—Landowner's Royalty under 160 acres leased to Humble Oil & Ref. Co. in Lea County, N. M., 27 pools in the county. Will sell in small interests. HARRY S. WRIGHT, FARMINGTON, NEW MEXICO.

ROYALTY WANTED, SMALL BLOCKS IN KANSAS AND OKLAHOMA. PREFER BARGAINS FROM OWNERS. BOX 618, GREAT BEND, KANSAS.

Situations Wanted

CAPABLE REFINERY DESIGN ENGINEERS, IN ORDER TO PUSH VICTORY CONSTRUCTION PROJECTS, wish to do consulting engineering and design work in spare time. References and details of experience furnished upon request. Box B-113, The Oil and Gas Journal, Tulsa, Okla.

STILLMAN experienced on topping, vacuum, and cracking, wishes position in Mid-West or Midcontinent. Now employed but available at once. Box B-112, The Oil and Gas Journal, Tulsa, Okla.

PRODUCTION AND DRILLING Superintendent, above draft age, desires position with reliable Company, have had many years practical experience, references. Box B-122, The Oil and Gas Journal, Tulsa, Oklahoma.

Help Wanted

DESIGNERS AND DRAFTSMEN
For vital war plant work carrying high priority ratings of A-1-A to A-1-C. Working 50 hours per week with remuneration on basis of a 40-hour week with time and one-half for work in excess of 40 hours per week. Program covers 1½ years. Must have experience in design of:
Oil Refinery Process Piping
Concrete and Structural Steel
Heat Exchangers, Pressure Vessels
Electrical Control, Light and Power Conduit Systems.
Instrument Engineers able to select and specify proper control instruments for oil refinery units.
Application should be made by letter giving age, nationality, concise outline of previous experience and educational background, present salary, salary desired and references. Include recent photograph.
BLAW-KNOX COMPANY
Process Industries Dept.
P. O. Box 5087
East Liberty Station, Pittsburgh, Pa.

WANTED: Middle-aged, experienced graduate production engineer to supervise and direct field operations for rapidly expanding Michigan production management company. References must be good. Box B-121, The Oil and Gas Journal, Tulsa, Oklahoma.

INDEPENDENT refiner, who is now building plant to manufacture 100 octane aviation gasoline, requires the services of a petroleum engineer who has had experience in the operation and design of Thermal and Catalytic Cracking Reforming, Gas Recovery and Alkylation plants. In replying give education, qualifications and refining experience in detail; also salary expected. TERMINAL REFINING CORPORATION, P. O. Box 1500, Corpus Christi, Texas.

ENGINEERS
DRAFTSMEN
SQUAD LEADERS
DESIGNERS

—experienced in design of power plants, concrete foundations, steel structures, pressure vessels, piping, sewers.

Oil refinery experience desirable.

Send complete details of professional experience, present salary, desired salary.

Jobs carry priority A-1-A.

40 hour week with time and one half for overtime.

J. F. PRITCHARD & CO.
528 Dwight Bldg., Kansas City, Mo.

WANTED: Man with general office or field sales experience by large reputable manufacturer of seamless and electric welded tubing, alloy and carbon steels. Please apply giving full information, experience, etc. to Box B-111 The Oil and Gas Journal, Tulsa, Okla.

Help Wanted

DESIGNERS
AND
DRAFTSMEN

For Oil Refinery work carrying high priority ratings of A-1-A and A-1-B under

Government Defense Program

Working 56 hours 3 weeks per month and 44 hours one week with time and one-half for work in excess of 40 hours per week.

Must have experience in design of:

Oil Refinery Process Piping,
Concrete and Structural,
Oil Heating Furnaces,
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and
Light and Power
Conduit Systems.

Can use several piping squad leaders. Must be thoroughly experienced on piping design and layout.

ARTHUR G. McKEE & COMPANY
Engineers & Contractors
OIL REFINERIES
BLAST FURNACES
STEEL PLANTS
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CHEMICAL ENGINEERS WANTED
with any of the following experience:
1. Petroleum refinery experience in operation or design of stabilizers, absorbers and light end equipment.
2. Refinery experience in design or operation of plants for solvent dewaxing and solvent extraction of lube oils.
3. Refinery experience in design or operation Thermal or Catalytic Cracking Plants.
In reply state education qualifications and refinery experience in detail. Also salary expected and status regarding military service.
FOSTER WHEELER CORPORATION
Room 2403, 165 Broadway,
New York.

Wanted

WANTED: Proven Oil production deals. $100,000 or more, no brokers.
M. R. TRAVIS
1702 S. Boulder. Ph. 2-2447, Tulsa, Okla.

Incorporation

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

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BURKHART'S legal blanks and general forms serving Mid-Cont. oil field since 1908—Okla. Kans. N. Mex. Tex. Ala. Ark. Fla. Ga. Ill. Ind. Ky. La. Mich. Miss. Mo. Neb. N. Dak. Tenn. Wyo. Free catalog samples on request. Burkhart Ptg. & Sta. Co., 115 S. Cinn., Tulsa, Oklahoma.

Financing

CAPITAL SEEKERS — Interested in raising $25,000 or more for a legitimate project should communicate with AMSTER LEONARD, Fox Theater Bldg., Detroit, Mich.

OUT OF 5000 American financial houses only 223 bought small issues last few years. The 223 names $4.00. JOHN F. MORRIS. Box 5411, Philadelphia.

Manufacturers' Agent

MANUFACTURERS Agent, 18 years representing first class line of specialties for drilling rigs, with Top Flight Contacts, Texas, Louisiana, and Arkansas. warehouse in Houston, interested in representing one or two reliable manufacturers of Drilling, Production, Refining, or Defense Equipment. Box A-993, The Oil and Gas Journal, Tulsa, Okla.

Equipment Wanted

WANTED
Large Steel Storage Tanks and Structural Steel Buildings.
GREENSPON'S
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WANTED
2—35,000-55,000 bbl. storage tanks.
2—1300' air compressors.
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R. C. STANHOPE, INC.
60 E. 42nd St., New York, N. Y.

WANTED
ALL SIZES
—CASING—
—TUBING—
&
—LINE PIPE—
Will Buy IN or ABOVE GROUND
State condition, Price and Location.
BOX B-100
THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

WANTED 4½ x 5 or 6 Power Driven Mud Pump, also 2⅞ Drill Rod 10 or 12 ft. length. O. L. Kelly, 318 7th St., Elk City, Okla.

WANTED
Three inch left hand couplings, Central Pipe Line Co., Aylmer, Ontario.

Wanted—Bubble towers, Reboilers, Reflux Drums, Treater Settlers, Coolers, Condensers, Pumps, Instruments, etc. Give specifications, prices and where can be seen. The Coastwise Petroleum Company, Munsey Building, Baltimore, Md.

W A N T E D—T O—B U Y
1 to 20 D-7 or D-8 Caterpillar Tractors with or without Dozers or Scrapers. Must be good condition.
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37 years' experience
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For Sale—Equipment

FOR SALE: At Oklahoma City, 65, 70, 75 and 85 HP Oil Field Type Boilers, repaired, tested and ready to go. Also large stock of unrepaired boilers. Patridge, Cities Service Oil Company, Bartlesville, Okla.

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Bubble Tower 5'x52'x⅜" — 21 Trays With Caps Chrome Alloy — 2000 bbl. Pipe Still, 2½" ID x 2 15/16" OD x 20' Tubes Alloy Headers — 8 Heat Exchangers, 255 sq. ft. ea. All New Tubes — Complete Copper Sweetening Unit — New Carload Ethyl Plant — 47 Storage Tanks from 500 to 15000 bbl. cap. — 30 Pumps All Types — Valves — Fittings — Pipe — 5 Transport Trucks Good Tires.

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FOR SALE: 1 Motor driven rotary drilling rig; suitable for 6,000 ft. work. Melton Supply Co., Seminole, Oklahoma.

NEW POWER UNITS
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25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.

Terms to suit.

CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St., Cincinnati, Ohio

FT. WORTH Spudder Super H, 2000' machine, with or without tools. Priced right. O. B. Hausam, 4203 S. Madison, Phone 4-4288, Tulsa, Okla.

2800 FEET, 3½" OD 13.30# Seamless Interior Upset Drill Pipe. All 21' 9" joints. Never drilled. Some tool joints. Current price, less 20%. Sorrento Petroleum Corp., American Bank Bldg., New Orleans, La.

FOR SALE: At Bartlesville, two 40-gallon Soda and Acid "Ajax" Fire Extinguishers mounted on wood wheels. Patridge, Cities Service Oil Co., Bartlesville, Okla.

EIGHTY extra heavy 3½" Key Headers, Jenkins Bubble Tower, Flash Tower, two Boilers and Settings, 2 Treating Towers, quantity of Valves and Fittings. Western Tank & Road Supply Co., Wichita, Kansas, or F. E. Reinhardt, General Delivery, Evansville, Ind.

FOR SALE: 12 K.W. Portable Light Plant powered by 35 H.P. International Engine. Melton Supply Co., Seminole, Okla.

FOR SALE: Burrton, Kansas, dismantled 122' Parkersburg Angle Iron Rotary Derrick. Complete with safety top, bull, calf wheel girt, outside framer sills, $700. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE

COMPRESSORS

Complete Repressuring or Air Lift Plant for Immediate Delivery.

2—13 & 5½ x 12 Ingersoll-Rand XOB compressors 400# pressure V-belt driven by 120 H.P. Chicago Pneumatic 3-cylinder vertical gas engines.

2—12 & 7 x 10 Chicago Pneumatic 400# pressure vertical compressors direct connected to 120 H.P. 3-cylinder Chicago Pneumatic vertical gas engines complete.

Used very little — excellent condition. Located on original foundation in Louisiana.

EARL E. KNOX COMPANY
Erie, Penna.

FOR SALE: Wilson-Mogul Drawworks with water cooled brakes and 100 H.P International Motor. Melton Supply Co., Seminole, Oklahoma.

TANKS: Three 100,000 and one 325,00 gallons; PIPING, VALVES, METERS. ETC. ON WATER FRONT IN PHILADELPHIA. Box A-992, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE: 1 Askenia Type Magnetometer #7970, $750.00. Cities Service Oil Co., Bartlesville, Okla.—H. D. Patridge.

REFINERY EQUIPMENT
From
RODESSA REFINERY, SHREVEPORT, LA.

ALLOY CRACKING TUBES—3½" OD x 2⅝" ID x 31' 6" long. 1¼ % Chrome DM K4B HEADERS—Series 7000. 3½" OD x 6¼" Centers.

ALSO AVAILABLE FOR IMMEDIATE DELIVERY:

1—CRACKING CHAMBER—6'0" x 65' 4¼" overall, self-supporting. Head and shell thickness 1 11/16". Quadruple riveted, double strap butt joints. Seams and rivets welded inside and outside.

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PUMPS, VALVES, FITTINGS, REFINERY SPECIALTIES, FRACTIONATING TOWERS, AND ABSORBERS.

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BROWN-STRAUSS CORPORATION

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Morton I. Glass, Resident Engineer

Main Office: Kansas City, Mo.
LD. Phone 169
Harry B. Strauss, Manager

LOOK

BRAUER PORTABLE DRILLING RIG COMPLETE with 2500'—3½ drill pipe; two drill collars; 5 x 12 Wilson-Snyder Pump powered by Caterpillar Motor; Light plant; Steel Tool House; Water Pump; Water Tank; 1200'—2" Water line; Steel substructure; Lumber, etc.

BRAUER MACHINE & SUPPLY CO.
Box 1469, Oklahoma City, Okla.

EMCO-McGAUGHY Integrator for Foxboro and Emco Recording Orifice Meter Charts, good condition. Utility & Industrial Supply Co., Jackson, Michigan.

I have sold second-hand alloyed once run Okla City Sucker rods to the largest independent oil producers in Kansas, Okla. & Texas, five producers have bought from 50 to 300,000 ft. all with good results. I am subject to call at anytime. I will dispose of the balance of ¾", ⅞" & 1" in truck load lots delivered to your location on 60 days trial, for about half of new price. Your use subject to the approval of my engineer. Can also be used for pull rods. Six 2½" x 7" Guiberson tubing catchers and six 2½" sucker rod overshots.

MIKE TRAVIS
1702 S. Boulder Tulsa, Okla.
Phone 2-2447

FOR SALE: Improved Type Hydraulic Pipe Pulling Machine. George W. Davis R.F.D. #2, Muskegon, Michigan.

FOR SALE

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IN GOOD CONDITION

2—80,000 Bbl.
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1—5,000 Bbl.
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3—2,500 Bbl.
1—3,000 Bbl.
1—1,000 Bbl.
1— 600 Bbl.
1— 100 Bbl.
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FOR SALE: 1—25 HP Westinghouse Sleeve Bearing Weatherproof type "CS" Electric Oil Well Pumping Motor. Serial #1134267; Class 3553; 3-phase: 60 cycle; 220/440 volt, 1150 R.P.M. Practically new. Box 390, Blackwell, Oklahoma.

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#81 KEYSTONE Spudder, 65. ft. mast, all steel, Caterpillar mount complete with 4" to 10" tools.

5 x 10 Gardner-Denver Mud Pump, 80 HP International Gas-Gasoline Motor, mounted on skids. Utility & Industrial Supply Company, Jackson, Michigan.

FOR SALE
35 H.P. Superior Gas Engine and 16 foot Band Wheel Power. Condition A-1. The Geo. McGinley Supply Co., Bowling Green, Kentucky.

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4 x 6 FAIRBANKS Morse pump (new). 40' 2" Goodall rotary hose with Boss Couplings, (new). 2000' 20' used "N" rods, 1500' 20' used "PK" rods. Large and small roller bearing Crown Blocks, small water swivels. 4½ x 10 Gardner Denver Pump on skids powered by BTU Buda Engine. Large Sullivan Drill capable of drilling 3000' slim holes or deeper coring. Priced to sell quickly. Box B-103, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE: Large quantity of Folded, Compressed Brake Lining suitable for Oil Well Machinery. Assorted widths and thickness, at very low prices. Samples and prices submitted upon request. Brake Lining Supply Co., Inc., 784 Commonwealth Ave., Boston, Mass.

FOR SALE: No. 45 Star Spudder with calf reel and heavy duty mast, also complete sheer poles. 60 Caterpillar skid type power unit equipped for butane, also belt pulley. One medium size safety pulling machine—Good condition. THE VEEDER SUPPLY & DEVELOPMENT CO., P. O. Box 270, Cherryvale, Kansas.

FOR SALE—1875 new 4½" OD Seamless 10 V. Thread Casing Coupling. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE—15,000 ft. used 4½" OD 15# Seamless P.E. Pipe. Patridge, Cities Service Oil Co., Bartlesville, Okla.

7' x 30' STEEL Riveted Horizontal Storage Tanks. Also towers, vessels, etc. GILBERT PIPE & SUPPLY, Electra, Tex.

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35 HP Superior Gas Engine with Clutch. 1st Class condition. GILBERT PIPE & SUPPLY, Electra, Tex.

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FOR SALE — 24,000' of ⅝" and 3000' of ¾" Pump Rods. One 87' MIW 157,000 lb. Derrick. One TC20B Oil Well Pump Unit, and misc. pumping equipment. All in first class condition. Dirks Brothers, Tuleta, Bee County, Texas.

FOR SALE—100 Sets—4½" O. D. National API Full Hole Tool Joints, all Refaced and in A-1 Condition. Joints all Caliper over 5⅛" O. D. Whitehead Supply Co., Longview, Texas.

FOR SALE—4300' of 5" O D Seamless casing. Run once. Earl E. Collier, Sterling, Colorado.

FOR SALE
Dean Brothers 4½ x 10 Heavy Duty Oil Bath Pump, 150 G. P. M. capacity at 500 pounds maximum pressure. Double acting piston type. In excellent condition, complete without motor or drive. Priced right for quick sale
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Mishawaka, Indiana.

FOR SALE: 6 x 16 Wilson-Snyder Power Slush Pump. Melton Supply Co., Seminole, Okla.

FOR SALE: Compression Booster Plant; Complete Unit with three 90 H.P. 2-Stage Chicago Pneumatic Compressors; 25 HP Superior Auxiliary gas engine; Light Plant; Circulating Pumps; Coils; 2 Eight thousand gallon Gasoline storage tanks; Structural Steel Building. This Unit only operated twelve months and is in A-1 mechanical condition. Write or call T. P. McAdams, Okmulgee, Okla.

FOR SALE: 200 ft. of 15½", 70# casing, run one time. P. O. Box 897, Sapulpa, Oklahoma.

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Journalisms:

DETERMINING when drill pipe should be removed from service is a problem on which the drilling contractor cannot afford to be wrong as an error in judgment may result in a fishing job which would remove the profit from several wells. This situation has led to wider adoption of inspection programs.

An incidental result of these inspections may cause a more important change in the drilling operation. It has been found that drill-pipe condition can be analyzed and the cause of the different troubles located. This in turn allows the drilling crew to change the method of operation so the life of the pipe will be prolonged.

An article by T. P. Sanders in next week's Engineering and Operating Section will discuss this very important phase of the steel-conservation program.

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TEAMED together this week are J. William Ferguson and Milton F. Shaffer, who give you "Application of Back-Pressure Tests to Gathering Systems," on Page 39. They entered the gas industry the same year—1929. Mr. Ferguson, who received his academic training in Colorado, and who on May 1 last was appointed associate natural-gas engineer for the U. S. Bureau of Mines, became interested in back-pressure tests in 1937, and devised a simplified method of calculating these tests, which was published in the Journal in the January 19, 1939, issue, with a supplement in the May 7, 1942, issue. Mr. Ferguson has also studied pipe-line flow problems and formulas, and has had an article published on the effect of differences in elevation along any pipe line on the flow characteristics of the line. For 5 years, immediately prior to his present occupation, he was assistant gas engineer for Canadian River Gas Co., in Amarillo, Tex.

J. W. FERGUSON

M. F. SHAFFER

Mr. Shaffer obtained his education in Oklahoma, joining Sinclair-Prairie Oil Co., gasoline department, in 1929, serving in various capacities ranging from chart man to chemist. Later he worked with J. E. Crosbie, Inc., and Hagy, Harrington & Marsh, for which latter concern he is now gas engineer in charge of measurement and production.

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WITH all due respect to the great authorities on art and literature it should be pointed out that skill in any line is appreciated by craftsmen of all types. The qualified cable-tool driller will give a bow to the expert machinist when he sees him at work and both may beam admiringly on the performance of a master boat builder. This may be due to the underlying and invisible bond which makes each of them superior in his own field.

Point will be given to this statement by announcing that in the near future The Oil and Gas Journal will publish in the Engineering and Operating Section articles on Modern Welding Shop Practices on Pipe Lines. These articles depict many of the devices developed to assist in the fabrication of the numerous items necessary to pipe-line operation. These devices are so utilitarian and so finished that all lovers of things mechanical will be pleased to see them.

There will be three of the articles and all will be extensively illustrated. Primarily, these are pipe-line articles, written by a pipe-line welding superintendent for pipe-line men. However, because of the universal bond mentioned further north, these articles will appeal to drillers, production men and refiners as well as to the men who keep the vital life lines of our nation in operation.

CALENDAR

June

CANADIAN GAS ASSOCIATION, thirty-fifth annual meeting, Windsor Hotel, Montreal, Que., June 4-5.

ILLINOIS-INDIANA PETROLEUM ASSOCIATION, annual conference, combined with ILLINOIS BASIN CHAPTER, AMERICAN PETROLEUM INSTITUTE, annual meeting, Robinson, Ill., June 6.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, semiannual meeting, Cleveland, Ohio, June 8-11.

AMERICAN SOCIETY OF TESTING MATERIALS, Chalfonte-Haddon Hall, Atlantic City, N. J., June 22-26.

September

NATIONAL PETROLEUM ASSOCIATION, annual meeting, Hotel Traymore, Atlantic City, N. J., September 16-18.

October

TEXAS MID-CONTINENT OIL AND GAS ASSOCIATION, twenty-third annual meeting, Dallas, Tex., October 8-10.

NATIONAL STRIPPER WELL ASSOCIATION, annual convention, Wichita, Kans., October 19.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, fall meeting, Rochester, N. Y., October 12-14.

INDIANA INDEPENDENT PETROLEUM ASSOCIATION, fall meeting, Hotel Severin, Indianapolis, Ind., October 14-15.

NATIONAL STRIPPER WELL ASSOCIATION, annual meeting, Wichita, Kans., October 19.

INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA, thirteenth annual convention, Wichita, Kans., October 20-22.

NATIONAL LUBRICATING GREASE INSTITUTE, tenth annual meeting, New Orleans, La., October 25-29.

ILLINOIS MINERAL INDUSTRIES CONFERENCE, Campus, University of Illinois, Urbana, Ill., October 30-31.

November

AMERICAN PETROLEUM INSTITUTE, twenty-third annual meeting, Stevens Hotel, Chicago, Ill., November 9-13.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS, thirty-fifth annual meeting, Netherlands Plaza Hotel, Cincinnati, Ohio, November 16-18.

AMERICAN CHEMICAL SOCIETY, national chemical exposition and national industrial chemical conference, Stevens Hotel, Chicago, Ill., November 17-21.

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